FURUNO

FCV-620/585

ECHO SOUNDER

OPERATOR'S MANUAL



FURUNO ELECTRIC CO., LTD.

www.furuno.co.jp

FCV-620/585 OPERATOR'S MANUAL

FURUNO ELECTRIC CO., LTD.

ECF

(Elemental Chlorine Free)

The paper used in this manual is elemental chlorine free.

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(YOTA) FCV-620/585

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IMPORTANT NOTICES

General

- The operator of this equipment must read and follow the descriptions in this manual. Wrong operation or maintenance can cancel the warranty or cause injury.
- Do not copy any part of this manual without written permission from FURUNO.
- If this manual is lost or worn, contact your dealer about replacement.
- The contents of this manual and equipment specifications can change without notice.
- The example screens (or illustrations) shown in this manual can be different from the screens you see on your display. The screens you see depend on your system configuration and equipment settings.
- Save this manual for future reference.
- Any modification of the equipment (including software) by persons not authorized by FURUNO will cancel the warranty.
- All brand and product names are trademarks, registered trademarks or service marks of their respective holders.

How to discard this product

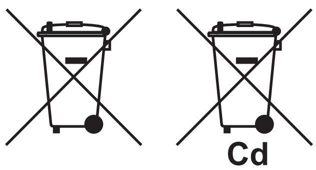
Discard this product according to local regulations for the disposal of industrial waste. For disposal in the USA, see the homepage of the Electronics Industries Alliance (http://www.eiae.org/) for the correct method of disposal.

How to discard a used battery

Some FURUNO products have a battery(ies). To see if your product has a battery, see the chapter on Maintenance. Follow the instructions below if a battery is used. Tape the + and - terminals of battery before disposal to prevent fire, heat generation caused by short circuit.

In the European Union

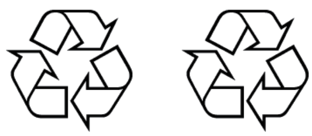
The crossed-out trash can symbol indicates that all types of batteries must not be discarded in standard trash, or at a trash site. Take the used batteries to a battery collection site according to your national legislation and the Batteries Directive 2006/66/EU.



Cd

In the USA

The Mobius loop symbol (three chasing arrows) indicates that Ni-Cd and lead-acid rechargeable batteries must be recycled. Take the used batteries to a battery collection site according to local laws.



Ni-Cd Pb

In the other countries

There are no international standards for the battery recycle symbol. The number of symbols can increase when the other countries make their own recycle symbols in the future.

⚠ SAFETY INSTRUCTIONS

Safety Instructions for the Operator

⚠ WARNING

Do not open the equipment.

There are no user-serviceable parts inside.

Do not disassemble or modify the equipment.

Fire, electrical shock or serious injury can result.

Immediately turn off the power at the switchboard if the equipment is emitting smoke or fire.

Continued use of the equipment can cause fire or electrical shock. Contact a FURUNO agent for service.

Do not maneuver the vessel based on the depth indication alone.

Grounding may result.

Use the proper fuse.

Fuse rating is shown on the equipment. Use of a wrong fuse can result in damage to the equipment.

About the TFT LCD

The TFT LCD is constructed using the latest LCD techniques, and displays 99.99% of its pixels. The remaining 0.01% of the pixels may drop out or blink, however this is not an indication of malfunction.

⚠ CAUTION

Do no turn on the equipment with the transducer out of water.

The transducer may be damaged.

The picture is not refreshed when picture advancement is stopped.

Maneuvering the vessel in this condition may result in a dangerous situation.

Use the proper gain setting.

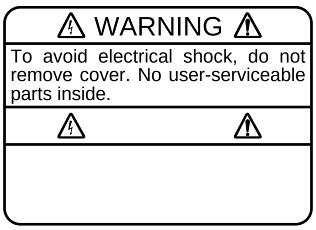
Incorrect gain may produce wrong depth indication, possibly resulting in a dangerous situation.

The data presented by this equipment is intended as a source of navigation information.

The prudent navigator never relies exclusively on any one source of navigation information, for safety of vessel and crew.

NOTICE

A warning label is attached to the equipment. Do not remove the label. If the label is missing or damaged, contact a FURUNO agent or dealer about replacement.



Name:
Warning Label (1)
Type: 86-003-1011-1
Code No.: 100-236-231

Safety Instructions for the Installer

⚠ WARNING

Turn off the power at the switchboard before beginning the installation.

Fire or electrical shock can result if the power is left on.

Be sure no water leaks in at the transducer or sensor mounting location.

Water leakage can sink the vessel. Also confirm that the transducer and sensor will not loosen by ship's vibration. The installer of the equipment is solely responsible for the proper installation of the equipment. FURUNO will assume no responsibility for any damage associated with improper installation.

Use the specified power cable.

Use of other power cable may result in fire.

⚠ CAUTION

Do not install the equipment where air bubbles and noise are present.

Performance will be affected.

The following are guidelines for handling of the transducer cable.

- Keep fuels and oils away from the cable.
- Locate it in a safe place.
- Do no paint the cable.

The sheath of the cable is made of chloroprene rubber (or polychloride vinyl). For this reason do not paint the cable.

Do not turn on the equipment with the transducer out of water.

The transducer may be damaged.

Observe the following compass safe distances to prevent interference to a magnetic compass:

Display unit	Standard compass	Steering compass
FCV-620	0.3 m	0.3 m
FCV-585	0.5 m	0.3 m

TABLE OF CONTENTS

FOREWORD

A Word to FCV-620/585 Owners

Congratulations on your choice of the FURUNO FCV-620/585 Color LCD Sounder. We are confident you will see why the FURUNO name has become synonymous with quality and reliability.

For over 60 years FURUNO Electric Company has enjoyed an enviable reputation for innovative and dependable marine electronics equipment. This dedication to excellence is furthered by our extensive global network of agents and dealers.

This equipment is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless operated and maintained properly. Please carefully read and follow the recommended procedures for operation and maintenance.

We would appreciate hearing from you, the end user, about whether we are achieving our purposes.

Thank you for considering and purchasing FURUNO equipment.

Features

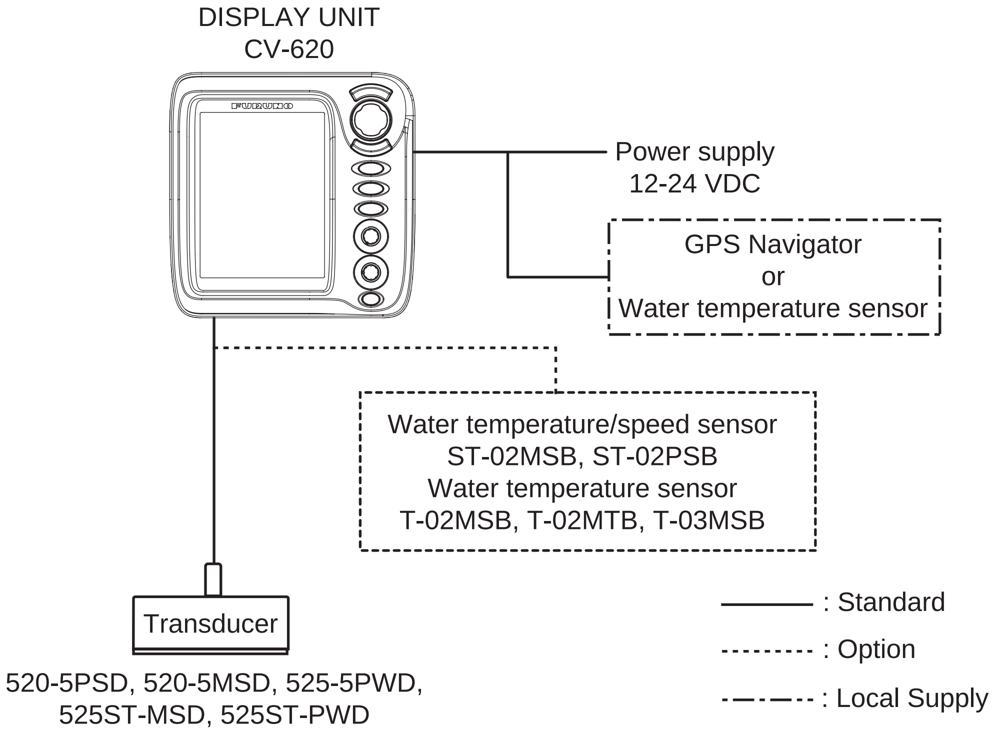
The FURUNO FCV-620/585 is a dual frequency (50 kHz and 200 kHz) Color LCD Sounder. Comprised of a display unit and a transducer, the FCV-620 displays underwater conditions on a 5.6-inch color LCD and the FCV-585 on an 8.4-inch color LCD.

The main features of the FCV-620/585 are

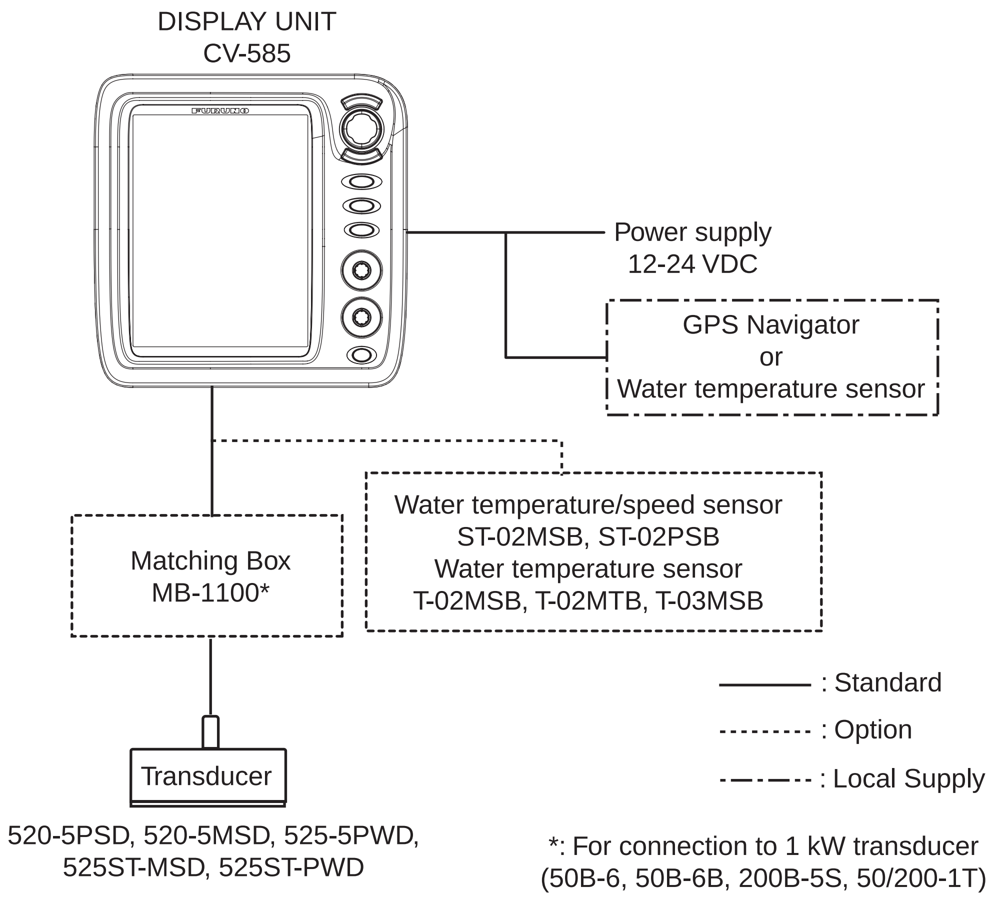
- Bright color LCD gives excellent readability even in broad daylight.
- Waterproof construction permits installation on open bridge.
- Automatic function being available on detecting fish school and bottom at both shallow and deep depth permits best display.
- User-programmable nav data displays provide analog and digital nav data.
- Alarms: Bottom, Fish (bottom lock and normal), Speed, Water Temperature and Arrival. (Speed, arrival and water temperature alarms require appropriate sensor.)
- White line feature helps discriminate fish lying near the bottom.
- Destination waypoint feature provides range, bearing, and time-to-go to destination waypoint (up to 20 waypoints).

SYSTEM CONFIGURATION

FCV-620



FCV-585



EQUIPMENT LISTS

Standard supply for FCV-620

Name	Type	Code No.	Qty	Remarks
Display Unit	CV-620	-	1	With hard cover
Transducer	520-5PSD	000-015-204	1	Thru-hull mount
	520-5MSD	000-015-212		Thru-hull mount
	525-5PWD	000-146-966		Transom mount
Triducer (transducer plus spd/temp sensor)	525ST-MSD	000-015-263		Thru-hull mount
	525ST-PWD	000-015-261		Transom mount
Installation Materials (CP02-07900)	• Cable assy. (1 pc., KON-004-02M, 000-156-405, for power and data) • Self-tapping screw (4 pcs., 5x25 SUS304, 000-162-610-10)			
Accessories (FP02-05501)	• Flush mounting sponge (1 pc., 02-154-1601-0, 100-329-460) • Wing nut (4 pcs., M4 SUS304, 000-863-331) • Flat washer (4 pcs., M4 SUS304, 000-864-126) • Spring washer (4 pcs., M4 SUS304, 000-864-256) • Threaded rod (4 pcs., M4x50 SUS304, 000-162-679-10) • MJ cable cap (1 pc., 02-154-1221-1, 100-329-441) • Filter cleaner (1 pc., 02-155-1082-1, 100-332-651-10)			
Spare Parts (SP02-05001)	Fuse (2 pcs., FGBO-A 125V 2A, 000-155-849-10)			
Template	C22-00502	000-156-349-1X	1	For flush mounting
		000-169-612-1X		
Operator’s Guide	MLG-23740	000-156-373-1X	1	
		000-169-611-1X		
Operator’s Manual	OME-23740	000-156-346-1X	1	
		000-169-608-1X		

Standard supply for FCV-585

Name	Type	Code No.	Qty	Remarks
Display Unit	CV-585	-	1	With hard cover
Transducer	520-5PSD	000-015-204	1	Thru-hull mount
	520-5MSD	000-015-212		Thru-hull mount
	525-5PWD	000-146-966		Transom mount
Triducer (transducer plus spd/temp sensor)	525ST-MSD	000-015-263		Thru-hull mount
	525ST-PWD	000-015-261		Transom mount

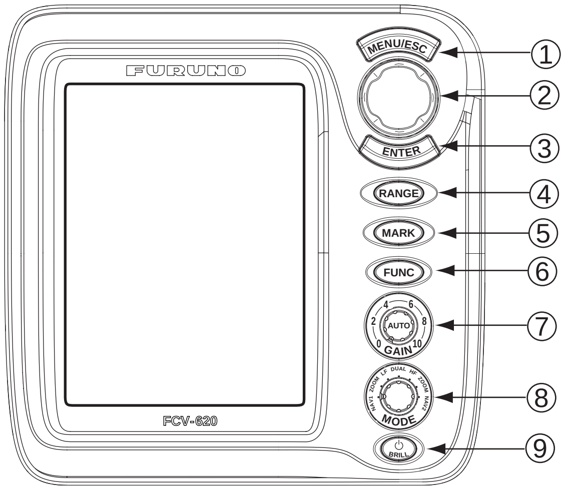
Name	Type	Code No.	Qty	Remarks
Installation Materials (CP02-07900)	• Cable assy. (1 pc., KON-004-02M, 000-156-405, for power and data) • Self-tapping screw (4 pcs., 5x25 SUS304, 000-162-610-10)			
Accessories (FP02-05601)	• Flush mounting sponge (1 pc., 02-155-1081-1, 100-330-851-10) • Wing nut (4 pcs., M4 SUS304, 000-863-331) • Flat washer (4 pcs., M4 SUS304, 000-864-126) • Spring washer (4 pcs., M4 SUS304, 000-864-256) • Threaded rod (4 pcs., M4x50 SUS304, 000-162-679-10) • MJ cable cap (1 pc., 02-154-1221-1, 100-329-441) • Filter cleaner (1 pc., 02-155-1082-1, 100-332-651-10)			
Spare Parts (SP02-05001)	Fuse (2 pcs., FGBO-A 125V 2A, 000-155-849-10)			
Template	C22-00504	000-158-577-1X 000-169-613-1X	1	For flush mounting
Operator’s Guide	MLG-23740	000-156-373-1X 000-169-611-1X	1	
Operator’s Manual	OME-23740	000-156-346-1X 000-169-608-1X	1	

Optional equipment for FCV-620/585

<table>
<tr><th>Name</th><th>Type</th><th>Code No.</th><th>Qty</th><th colspan="2">Remarks</th></tr>
<tr><td>Conversion Cable</td><td>02S4147</td><td>000-141-082</td><td>1</td><td colspan="2">For water temperature and spd/temp sensors</td></tr>
<tr><td rowspan="2">Water Temperature & Speed Sensor</td><td>ST-02MSB</td><td>000-137-986</td><td rowspan="2">1</td><td rowspan="2" colspan="2">Thru-hull type</td></tr>
<tr><td>ST-02PSB</td><td>000-137-987</td></tr>
<tr><td rowspan="3">Water Temperature</td><td>T-02MTB</td><td>000-040-026</td><td rowspan="3">1</td><td colspan="2">Transom mount, w/8 m cable</td></tr>
<tr><td>T-02MSB</td><td>000-040-040</td><td colspan="2">Thru-hull mount</td></tr>
<tr><td>T-03MSB</td><td>000-040-027</td><td colspan="2">Thru-hull mount, w/8 m cable</td></tr>
<tr><td>Inner Hull Kit S</td><td>22S0191</td><td>000-802-598</td><td>1</td><td colspan="2"></td></tr>
<tr><td>Matching Box</td><td>MB-1100</td><td>000-041-353</td><td>1</td><td>For connec-tion to 1 kW transducer</td><td rowspan="5">For FCV-585</td></tr>
<tr><td rowspan="4">Transducer</td><td>50B-6</td><td>000-015-042</td><td rowspan="4">1</td><td>10 m, 1 kW</td></tr>
<tr><td>50B-6B</td><td>000-015-043</td><td>15 m, 1 kW</td></tr>
<tr><td>200B-5S</td><td>000-015-029</td><td>10 m, 1 kW</td></tr>
<tr><td>50/200-1T</td><td>000-015-170</td><td>10 m, 1 kW</td></tr>
</table>

1. OPERATION

1.1 Control Description



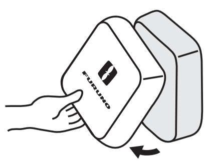
Display unit for FCV-620

Note: The FCV-620 and FCV-585 share the same features. For sake of brevity, this manual uses "FCV-620".

No.	Control	Function
1	MENU/ESC	• Opens/closes menu. • Escapes from current operation.
2	▲▼◀▶ (TrackPad)	• Moves cursor on the menu. • Adjusts settings. • Moves VRM (Variable Range Marker) by using ▲ or ▼ except for nav mode.
3	ENTER	Saves settings.
4	RANGE	Opens display range setting window.
5	MARK	Records the position of an important echo as waypoint. (Outputs latitude and longitude position to a plotter.)
6	FUNC	Opens user defined window.
7	GAIN	• Push: Opens automatic gain setting window. • Rotating: Manually adjusts gain (with automatic gain adjustment off).
8	MODE	Selects display mode.
9	⏻/BRILL	• Turns power on/off. • Opens display contrast/brilliance setting window. (The FCV-585 does not have the contrast function.)

How to remove the hard cover

Place fingers below cover, pull cover forward and lift it.

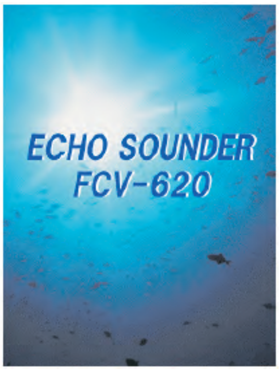


When removing the display unit

To keep out dust from connectors:
- Cover transducer cable's connector with MJ cable cap (supplied).
- Cover two connectors on display unit with their caps.
- Cover power cable's connector with its cap.

1.2 Power On/Off

1. Press the ⏻/**BRILL** key to turn on the power.
   The unit beeps, the startup screen appears, and then the equipment checks the ROM and RAM for proper operation. After the completion of the equipment check, the last-used display appears.

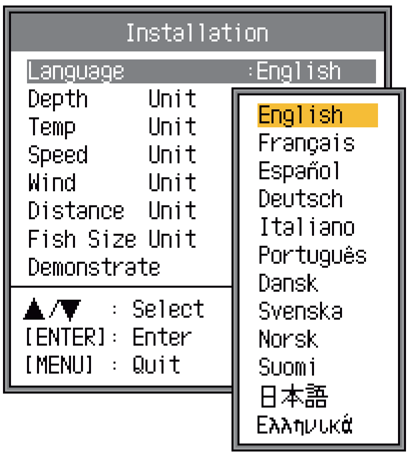


Startup screen

2. To turn off the power, press the ⏻ **/BRILL** key more than three seconds.
   The time remaining until power is turned off is counted down on the screen.

Note1: If "ROM/RAM check error!" appears, try to press any key except the ⏻ **/BRILL** key to start operation. However, the equipment may not work properly. Contact your dealer.

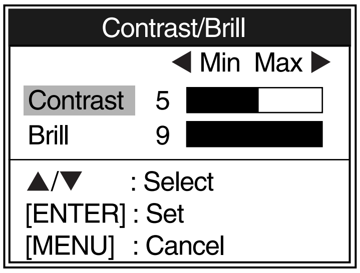
Note2: The first time you turn on the power (or any time the power is applied after a memory reset), the installation menu appears. See the figure below.
When this occurs, press the **MENU/ESC** key twice to close the menu.



Installation menu

1.3 Adjusting Display Contrast and Brilliance

1. Press the ⏻/**BRILL** key momentarily to show the contrast/brilliance adjustment window. (The FCV-585 does not have the contrast function.)



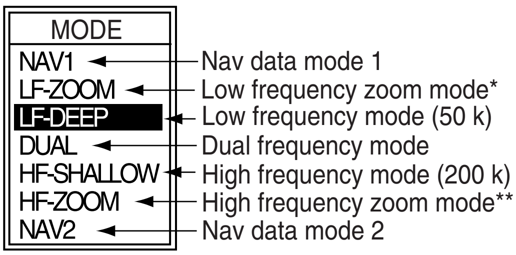
Contrast/brilliance adjustment window

2. To adjust brilliance, press the ⏻/**BRILL** key. Continual pressing changes the brilliance continuously (0→1→...→9→8→...→0→1→...). "0" is the dimmest and "9" is the brightest.
   After selecting "Brill" by using ▲ or ▼, you may also use ◀ or ▶ to adjust brilliance.
3. To adjust contrast, after selecting "Contrast" by using ▲ or ▼, use ◀ or ▶ (only for FCV-620). "0" is the lowest and "9" is the highest.
4. Press the **ENTER** key to save the setting and close the window.

Note: When the power is reapplied after turning off the equipment with minimum brilliance, minimum brilliance will be set after the equipment goes through its initial start up. (The start up screen appears with the maximum brilliance.) Adjust the brilliance as necessary.

1.4 Choosing a Display Mode

1. Rotate the **MODE** knob to open the mode setting window, which is displayed for five seconds.



*: The indication at the top on the screen is B/L-LF, B/Z-LF or M/Z-LF.
**: The indication at the top on the screen is B/L-HF, B/Z-HF or M/Z-HF.

B/L: Bottom lock, LF: Low frequency,
B/Z: Bottom zoom, HF: High frequency,
M/Z: Marker zoom

2. Rotate the **MODE** knob again to choose the display mode desired.
   The screen you chose appears soon thereafter.

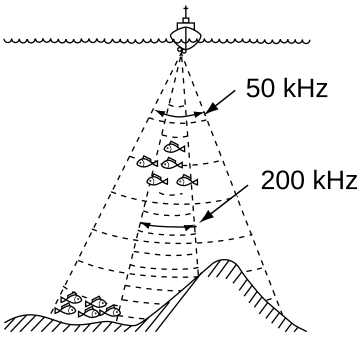
Single frequency display

Low frequency (50 kHz)

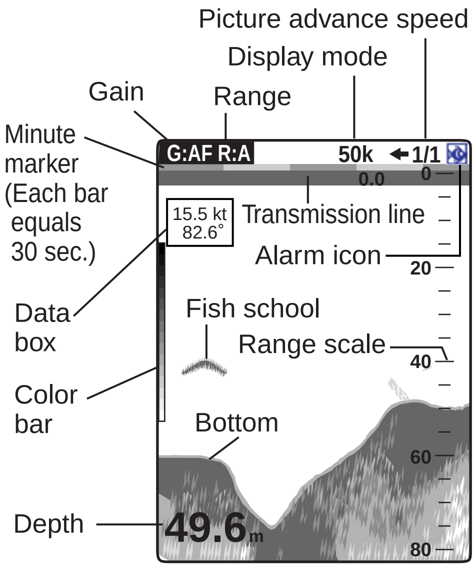
The sounder uses ultrasonic signals to detect bottom conditions. The lower the frequency of the signal, the wider the detection area. Therefore, the 50 kHz frequency is useful for general detection and judging bottom condition.

High frequency (200 kHz)

The higher the frequency of the ultrasonic signal, the better the resolution. For this reason the 200 kHz frequency is ideal for detailed observation of fish schools.



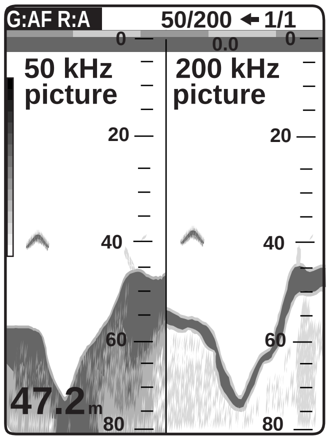
Frequency and coverage area



Single frequency display

Dual frequency display

The 50 kHz picture appears on the left; the 200 kHz picture on the right. This display is useful for comparing the same picture with two different frequencies.



Dual frequency display

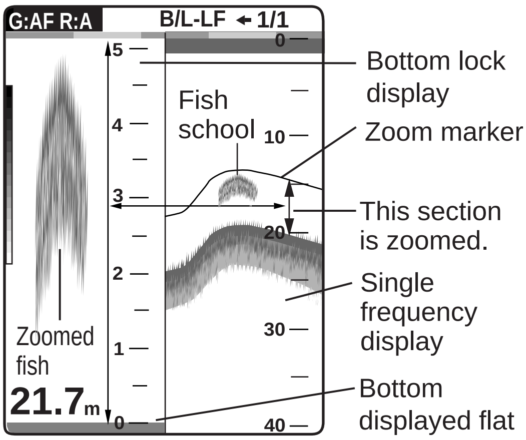
Frequency	Beam width	Resolution	Detectable range	Bottom tail
50 kHz	Wide	Low	Deep	Long
200 kHz	Narrow	High	Shallow	Short

Zoom display (50/200 kHz)

Zoom mode expands chosen area of the single frequency picture. Three modes are available: bottom lock, bottom zoom and marker zoom. The default mode is bottom lock. To change a mode, see page 17.

Bottom lock display

The bottom lock display provides a normal picture on the right half of the screen and a 10-30 feet (default: 15 feet) wide layer in contact with the bottom is expanded onto the left half of the screen. This mode is useful for detecting bottom fish.



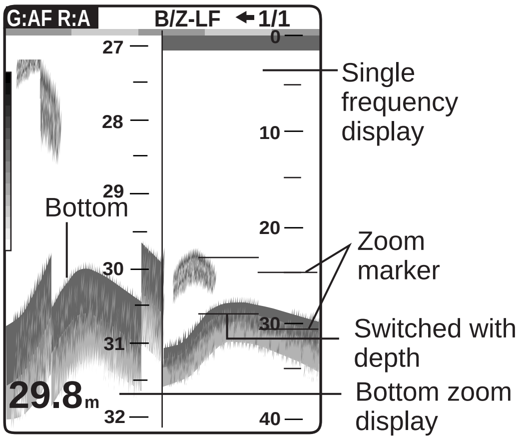
Bottom lock display

Note1: To adjust the range of the zoom display, go to the Range menu (see page 20).

Note2: To turn on or off the Zoom Marker, go to the Display menu (see page 18).

Bottom zoom display

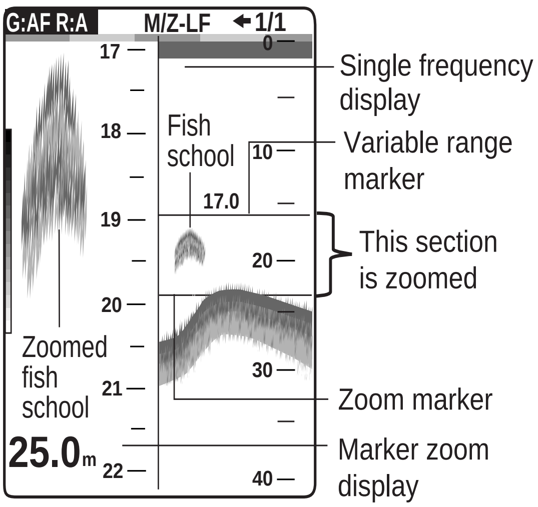
This mode expands bottom and bottom fish on the left-half window. This mode is useful for determining bottom contour. When the bottom depth increases, the display automatically shifts to keep the bottom echo at the lower part of the screen.



Bottom zoom display

Marker zoom display

This mode expands chosen area of the normal picture to full vertical size of the screen on the left-half window. You may specify the portion to expand by operating the VRM (Variable Range Marker), which you can shift with ▲ or ▼. The area between the VRM and zoom marker is expanded. This mode is useful for determining the size of fish in the middle water.



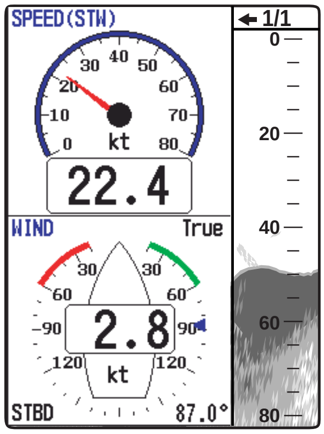
Marker zoom display

Nav data displays

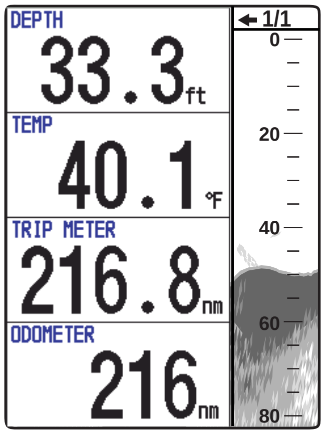
The nav data displays appear on the left of the screen. Data other than depth requires appropriate sensor.

Two nav data displays are available, Nav Data 1 or Nav Data 2, and you may choose which to use on the Display menu. The default settings are as follows.

Nav Data 1: Two-data display (SPEED (STW), WIND)
Nav Data 2: Four-data display (DEPTH, TEMPERATURE, TRIP METER, ODOMETER)
You can display between two and four items in a nav data display and choose the item and order to display them. For details, see section 1.19.



Nav Data 1 display



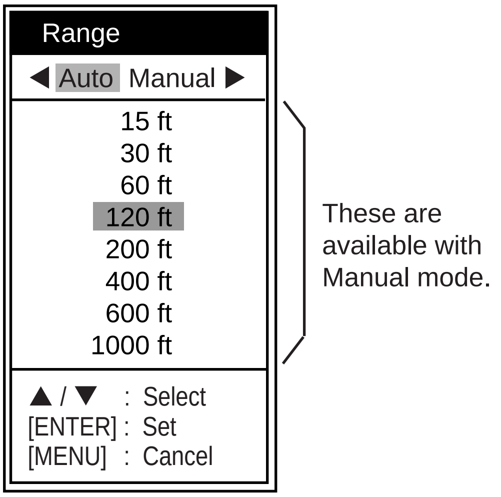
Nav Data 2 display

Sample Nav Data displays (Default setting)

1.5 Choosing Range

The basic range may be chosen in Auto or Manual mode.

1. Press the **RANGE** key to open the range setting window.



Range setting window

2. Use ◀ or ▶ to choose Auto or Manual.
   Auto: The range changes automatically to display the bottom echo on the screen. The range shifting functions are inoperative in Auto mode. “R:A” is shown at the top left corner on the screen.
   Manual: The range may be chosen from the eight ranges. “R:M” is shown at the top left corner on the screen.
   If you choose Auto go to step 4. For manual go to the next step.
3. For Manual, use ▲ or ▼ to choose the range.

Default ranges

Unit	Basic Range							
	1	2	3	4	5	6	7	8
m	5	10	20	40	80	150	200	300
ft	15	30	60	120	200	400	600	1000
fa	3	5	10	20	40	80	100	150
pb	3	5	10	20	50	100	150	200
HR*	4	8	15	30	50	100	150	200

*: Japanese unit of depth measurement

Note: Basic ranges may be preset as desired. For further details, see page 20.

4. Press the **ENTER** key.

Note: The range mode indication, which appears at the top-left corner, may be turned on or off with Header Info on the Display menu. For details, see page 19.

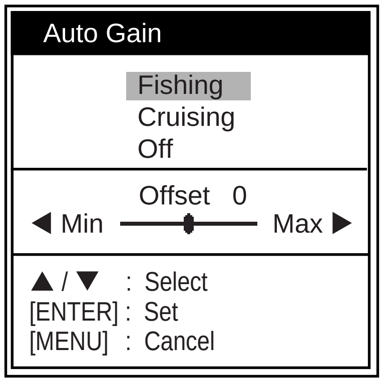
1.6 Adjusting Gain

The gain may be adjusted automatically (Fishing or Cruising) or manually.

Fishing and Cruising

The gain (or receiver sensitivity) is adjusted automatically for Fishing and Cruising mode so that the bottom is displayed as reddish brown. Gain offset lets you override automatic gain adjustment.

1. Press the **GAIN** knob to open the Auto Gain setting window.



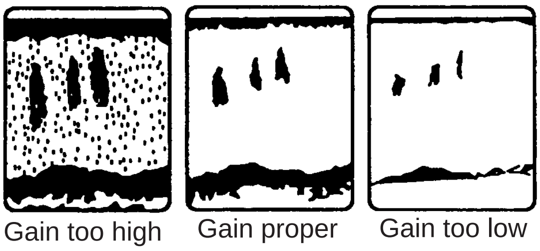
Auto Gain setting window

2. Press the **GAIN** knob again to choose Fishing or Cruising.
   You may also use ▲ or ▼ to choose the mode.
   Fishing: This mode clearly displays weaker echoes and is for searching fish schools. “G:AF” is shown at the top left corner on the screen.
   Cruising: This mode clearly displays stronger echoes (for example, bottom), suppresses weak echoes and is for general cruising.
   “G:AC” is shown at the top left corner on the screen.
   Off: For manual adjustment
   Adjusting gain offset proceed, if not go to step 4.
3. If you need, adjust the gain offset with ◀ or ▶ (setting range: -5 to +5).
   Pressing ◀ lowers the gain, ▶ raises the gain.
4. Press the **ENTER** key.

Manual gain adjustment

The **GAIN** knob adjusts the sensitivity of the receiver. Generally, use a higher gain setting for greater depths and a lower setting for shallower waters.

⚠ CAUTION
Use the proper gain setting. Incorrect gain may produce wrong depth indication, possibly resulting in a dangerous situation.



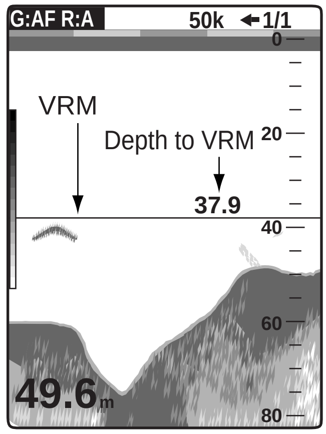
Examples of proper and improper gain

1. Press the **GAIN** knob to open the Auto Gain setting window.
2. Press the **GAIN** knob again to choose Off. "G:M" appears at the top left corner on the screen.
3. Press the **ENTER** key.
4. Rotate the **GAIN** knob to adjust the gain. The setting range is 0.0 to 10.
   Adjust so that a slight amount of noise remains on the screen.
   The setting gain is shown at the top of the screen as G (Gain) + XX (setting value).

1.7 Measuring Depth

The VRM (Variable Range Marker) functions to measure the depth to fish schools, etc.

1. Use ▲ or ▼ to place the VRM on the object to measure depth.
2. Read the VRM depth just above the VRM.

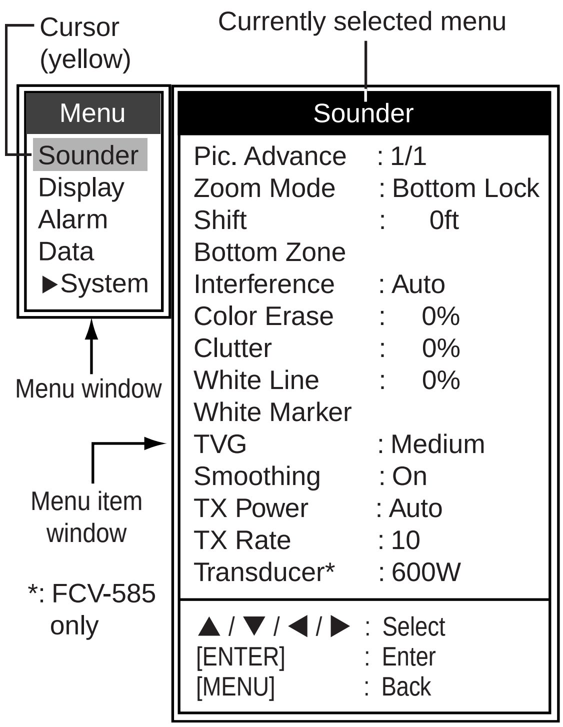


How to measure depth with the VRM

1.8 Menu Operating Procedure

The FCV-620/585 have five menus: Sounder, Display, Alarm, Data, and System. Below is the basic menu operating procedure.

1. Press the **MENU/ESC** key to open the menu.



Menu

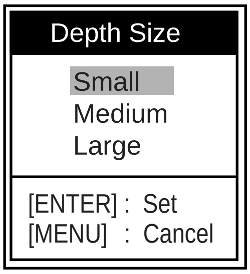
2. Use ▲ or ▼ to choose the menu or sub menu desired.
   The cursor (yellow) shows current selection. The items in the right window change with menu selected.
3. Press the **ENTER** key.
   The cursor (yellow) shifts to the menu item window (right) and the current selection on

the menu window (left) is displayed to gray. You may also use ▶ to move the cursor.

4. Use ▲ or ▼ to choose the menu item desired and press the **ENTER** key.
   The selected setting box or window appears.



Setting box

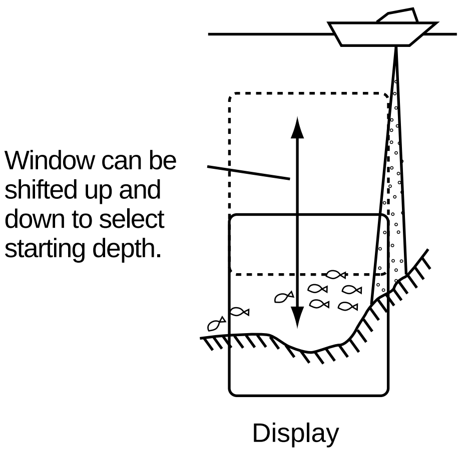


Setting window

5. Use ▲ or ▼ to choose an option.
6. Press the **ENTER** key to save the setting. The setting box or window disappears. To escape without changing setting press the **MENU/ESC** key instead of the **ENTER** key.
7. To choose another menu press the **MENU/ESC** key.
   The cursor (yellow) moves to the menu window. You may also use ◀ to move the cursor.
8. Press the **MENU/ESC** key to close the menu.

1.9 Shifting Range

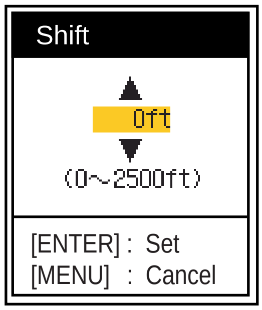
The basic range may be shifted up or down in the Manual mode as follows:



Range and display shift concept

Note: This function is inoperative when Auto mode is selected on the range setting window.

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Sounder and press the **ENTER** key.
3. Use ▲ or ▼ to choose Shift and press the **ENTER** key.



Shift setting window

4. Use ▲ or ▼ to choose the amount of shift desired and press the **ENTER** key.
   The step for the amount of shift depends on setting range on the Range sub menu of the System menu.

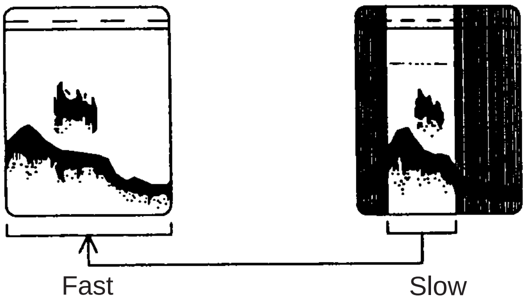
Unit: ft		**Unit: m**	
Range	Step	Range	Step
7 - 10	2	2 - 5	1
11 - 20	5	6 - 10	2
21 - 50	10	11 - 20	5
60 - 100	20	21 - 50	10
110 - 250	50	60 - 100	20
260 - 500	100	110 - 250	50
550 - 1000	200	260 - 500	100
1100 - 2500	500	550 - 800	200
Unit: fa		**Unit: pb**	
Range	Step	Range	Step
2 - 5	1	2 - 5	1
6 - 10	2	6 - 10	2
11 - 20	5	11 - 20	5
21 -50	10	21 - 50	10
60 - 100	20	60 - 100	20
110 - 250	50	110 - 250	50
260 - 400	100	260 - 450	100

5. Press the **MENU/ESC** key twice to close the window.

Note: The echo may be lost if the amount of shift is greater than actual depth.

1.10 Choosing Picture Advance Speed

The picture advance speed determines how quickly the vertical scan lines run across the screen. When choosing a picture advance speed, keep in mind that a fast advance speed will expand the size of the fish school horizontally on the screen and a slow advance speed will contract it. A fast advance speed is useful for observing the rugged bottom minutely. A slow advance speed is useful for observing the smooth bottom.



Picture and picture advance speed

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Sounder and press the **ENTER** key.

Sounder	
Pic. Advance	: 1/1
Zoom Mode	: Bottom Lock
Shift	: 0ft
Bottom Zone	
Interference	: Auto
Color Erase	: 0%
Clutter	: 0%
White Line	: 0%
White Marker	
TVG	: Medium
Smoothing	: On
TX Power	: Auto
TX Rate	: 10
Transducer*	: 600W
▲ / ▼ / ◀ / ▶	: Select
[ENTER]	: Enter
[MENU]	: Back

*: FCV-585 only

Sounder menu

3. Use ▲ or ▼ to choose Pic. Advance and press the **ENTER** key.

Pic. Advance	
4/1	Fast
2/1	↑
1/1	
1/2	
1/4	
1/8	
1/16	↓
Stop	Slow
▲ / ▼ : Select	
[ENTER] : Set	
[MENU] : Cancel	

Pic. Advance setting window

4. Use ▲ or ▼ to choose picture advance speed desired and press the **ENTER** key. 1/16 is the slowest speed and 4/1 is the fastest speed. 1/16 means one scan line is produced every 16 transmissions. Current picture advance is displayed at the top-right corner of the screen.

⚠ CAUTION

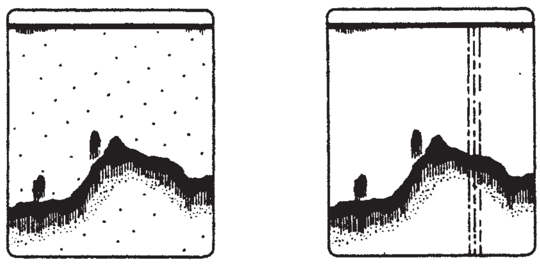
The picture is not refreshed when picture advancement is stopped.

Maneuvering the vessel in this condition may result in a dangerous situation.

5. Press the **MENU/ESC** key twice to close the window.

1.11 Suppressing Interference

Interference from other acoustic equipment operating nearby or other electronic equipment on your boat may show itself on the display as shown in the figure below. Follow the procedure below to suppress interference.

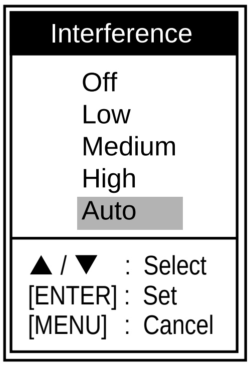


Interference from other sounder

Electrical interference

Interference

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Sounder and press the **ENTER** key.
3. Use ▲ or ▼ to choose Interference and press the **ENTER** key.



Interference setting window

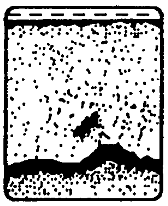
4. Use ▲ or ▼ to choose the degree of suppression desired and press the **ENTER** key.
   Off: Turn off interference rejector.
   Low, Medium, High: High provides the greatest degree of suppression and Low is the smallest.
   Auto: Interference is suppressed automatically.

Note: Turn off the interference rejector when no interference exists, so as not to miss echoes from small fish.

5. Press the **MENU/ESC** key twice to close the window.

1.12 Suppressing Low Level Noise

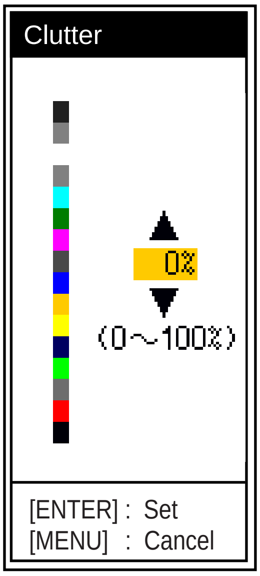
Low intensity "speckles" may appear over most of screen. This is mainly due to sediment in the water or noise. These can be suppressed by adjusting Clutter on the menu.



Clutter appearance

Note: Clutter cannot be adjusted when Fishing or Cruising is selected on the Auto Gain setting window.

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Sounder and press the **ENTER** key.
3. Use ▲ or ▼ to choose Clutter and press the **ENTER** key.

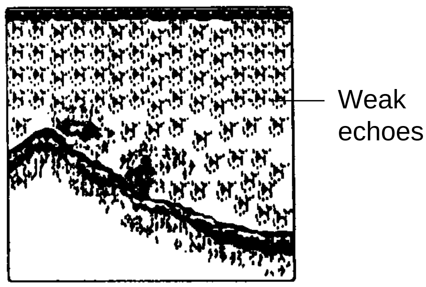


Clutter setting window

4. Use ▲ or ▼ to choose the degree of suppression desired and press the **ENTER** key. The setting range is 0 to 100 % in intervals of ten. The larger the setting value, the greater the degree of suppression.
5. Press the **MENU/ESC** key twice to close the window.

1.13 Erasing Weak Echoes

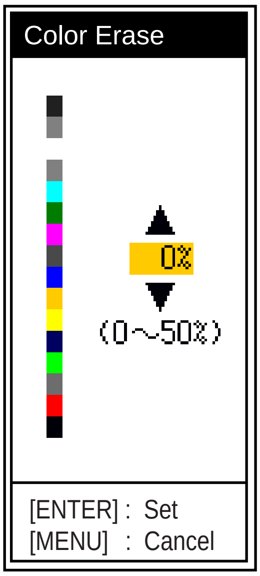
Sediment in the water or reflections from plankton may be painted on the display in low intensity tones.



Appearance of weak echoes

These weak echoes may be erased by using the “Color Erase”. This function erases weaker echoes sequentially to show only strong echoes and clear up the picture.

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Sounder and press the **ENTER** key.
3. Use ▲ or ▼ to choose Color Erase and press the **ENTER** key.



Color Erase setting window

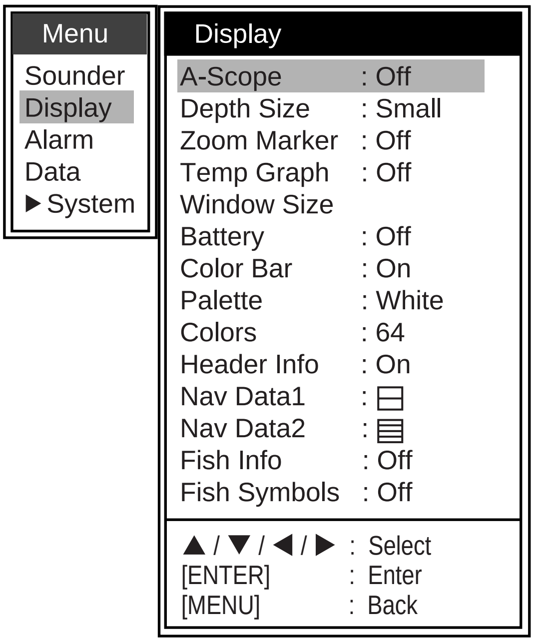
4. Use ▲ or ▼ to choose the color to erase and press the **ENTER** key. The setting range is 0 to 50 % in intervals of five. The larger the setting value, the greater the degree of erasion.
5. Press the **MENU/ESC** key twice to close the window.

1.14 A-Scope Display

This display shows echoes at each transmission with amplitudes and tone proportional to their intensities, on the right of the screen. It is useful for estimating the kind of fish school and bottom composition.

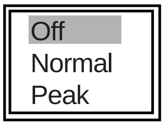
Note: In the dual frequency display, the A-Scope display is only available with the high frequency display.

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Display and press the **ENTER** key.



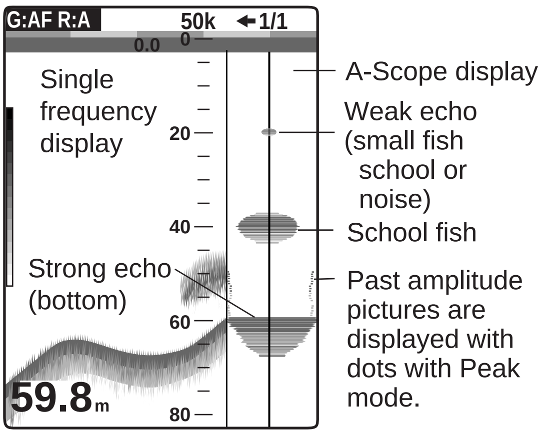
Display menu

3. Use ▲ or ▼ to choose A-Scope and press the **ENTER** key.



A-Scope setting box

4. Use ▲ or ▼ to choose the A-Scope presentation type desired and press the **ENTER** key.
   Normal: Display shows echoes at each transmission with amplitudes and tone proportional to their intensities.
   Peak: "Normal" A-Scope display plus peak-hold amplitude picture for last five seconds in dots.
5. Press the **MENU/ESC** key twice to close the window.



A-Scope display

Note: To turn off the A-Scope display, choose Off at step 4 and then press the **ENTER** key.

1.15 Fish Information

You can turn the fish symbol indication (Solid or Striped) on or off. Also, you can show or hide the fish size and the depth value. For details about the Fish Symbols, see the information which follows the procedures in this section.

Note: The fish size found by this sounder is intended for reference purposes; it is not an accurate measurement of fish length.

Fish Symbols

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Display and press the **ENTER** key.
3. Use ▲ or ▼ to choose Fish Symbols and press the **ENTER** key.



Fish Symbols setting box

4. Use ▲ or ▼ to choose Off, Solid or Striped as appropriate and press the **ENTER** key. The symbol size depends on the fish size.

Fish size	Solid	Striped
Large fish symbol (more than 50 cm, or more than 20 inches)		
Small fish symbol (10 to 49 cm, or 4 to 19 inches)		

Note: To hide the fish symbol, choose Off at step 4 and press the **ENTER** key.

5. Press the **MENU/ESC** key twice to close the window.

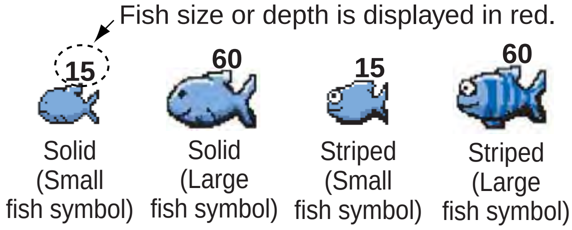
Fish Info

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Display and press the **ENTER** key.
3. Use ▲ or ▼ to choose Fish Info and press the **ENTER** key.

Off
Fish Size
Depth

Fish Info setting box

4. Use ▲ or ▼ to choose Off, Fish Size or Depth as appropriate and press the **ENTER** key.



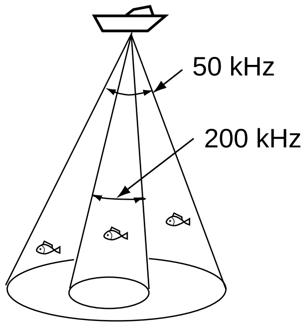
Fish symbols with fish info figure

Note: You can show the fish info figure alone (without fish symbol) by turning off Fish Symbols on the Display menu.

5. Press the **MENU/ESC** key twice to close the window.

Principle of fish size

Returning echoes at the center of the transducer beam are used in fish size calculation. Fish for size calculation are taken from the 200 kHz beam and their size is calculated from their strengh found with the 50 kHz beam. In the example below, only the fish at the center of the figure is used for size calculation.



Principle

Consideration for fish information

- The 600 W transducers which offer size calculation are 520-5PSD, 520-5MSD, 525-5PWD, 525ST-MSD and 525ST-PWD.
- For 1 kW transducer, the integrated type 50/200-1T is recommended to display the fish symbol and the fish size. When using both 50B-6 and 200B-5S, they should be installed in close proximity to each other.
- Echo intensity depends on fish specie. When the fish size differs between the indicated value and the fish caught, you can compensate it on the Calib menu (see section 2.6).

- When Fish Symbols or Fish Info are enabled, 50 kHz and 200 kHz beams are transmitted alternately even if a single frequency mode is in use.
- Fish within the zero line area are not measured.
- To reduce error, the detection area should be approx. 6 to 330 feet from the surface.
- With the inside-hull transducer, signal attenuation is different between 50 kHz and 200 kHz. Therefore, a fish may not be detected or the fish size indicated may be smaller than actual size.
- In case of a fish school, echoes overlap one another, so the margin of error will be greater.
- The fish symbol indication is off when the bottom is not displayed on the screen.

1.16 Alarms

The FCV-620/585 have six conditions which generate both audio and visual alarms: bottom alarm, normal fish alarm, bottom lock fish alarm, water temperature alarm, speed alarm and arrival alarm. (The water temperature, speed and arrival alarms require appropriate sensors.) To silence the buzzer press any key.

Bottom alarm: The bottom alarm alerts you when the bottom displayed in red or reddish brown echo is within the alarm range set. To activate the bottom alarm the depth must be displayed.

Fish (normal) alarm: The fish (normal) alarm tells you when an echo above a certain strength (selectable) are within the preset alarm range. See page 13 for alarm level setting.

Fish (bottom lock) alarm: The fish (bottom lock) alarm sounds when fish are within a certain distance from the bottom. Note that the bottom lock display must be turned on to use this alarm.

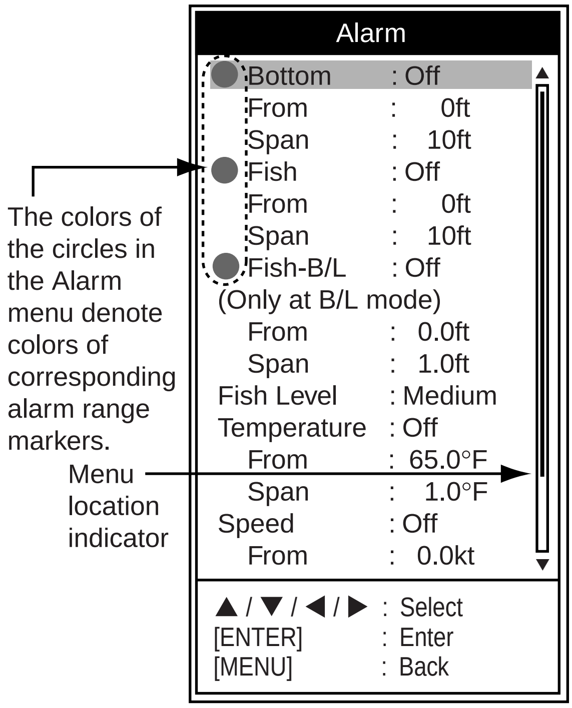
Water temperature alarm: The water temperature alarm alerts you when the water temperature is within (inside alarm) the alarm range set or under/over (outside alarm) the range set.

Speed alarm: The speed alarm alerts you when the speed is within (inside alarm) or under/over (outside alarm) the preset speed.

Arrival alarm: The "Inside" arrival alarm alerts you when you approach to the destination waypoint by the distance set. Alternatively, the "Outside" arrival alarm alerts when you go away from the preset range from a certain position.

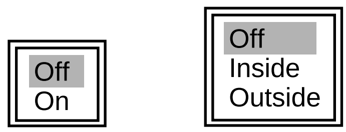
Activating an alarm

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Alarm and press the **ENTER** key.



Alarm menu

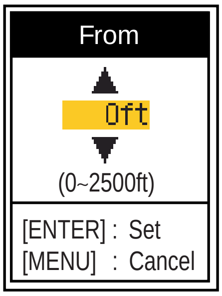
3. Use ▲ or ▼ to choose an alarm desired and press the **ENTER** key.



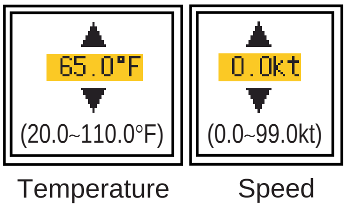
Fish and Bottom Alarm   Temp, Speed and Arrival Alarm

Alarm options

4. Use ▲ or ▼ to choose alarm type:
   Off: Alarm off
   On: Alarm on
   Inside: Alarm generated when speed, water temperature or arrival distance is within the range set.
   Outside: Alarm generated when speed, water temperature or arrival distance is outside the range set.
5. Press the **ENTER** key.
   For Arrival Alarm, go to step 8.
6. Use ▼ to choose From and press the **ENTER** key.

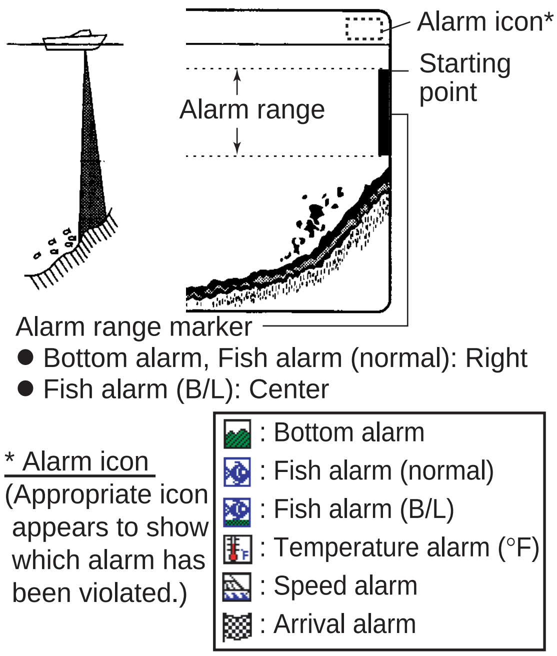


Depth setting window



Temperature, Speed setting box

7. Use ▲ or ▼ to set starting depth, temperature or speed as appropriate and press the **ENTER** key. For Bottom and Fish (Normal), the starting depth is the range from the transducer, and for Fish (B/L), from the bottom.



How the alarm works

8. Use ▼ to choose Span (or Radius for Arrival) and press the **ENTER** key.
9. Use ▲ or ▼ to set the range of depth, temperature, speed or distance as appropriate. To shorten the alarm range marker use ▼, and to lengthen use ▲.
10. For the bottom alarm, temperature alarm, speed alarm or arrival alarm, press the **ENTER** key to finish, and then go to step 13. For a fish alarm, press the **ENTER** key and go to step 11.
11. Use ▼ to choose Fish Level and press the **ENTER** key.



Fish Level setting box

12. Use ▲ or ▼ to choose the echo strength level which will trigger a fish alarm and press the **ENTER** key.
    Weak: Light-blue or stronger echoes
    Medium: Yellow or stronger echoes
    Strong: Red and reddish brown echoes
13. Press the **MENU/ESC** key twice to close the window.

Note1: To disable an alarm, choose Off at step 4 in the above procedure.

Note2: The audio and visual alarms are released against the last-violated alarm when multiple alarms are active.

1.17 FUNC Key

The **FUNC** key provides for instant display of a user-defined options window chosen with FUNC Key on the Key menu. Nine items are available: Pic. Advance (default), Shift, Interference, Clutter, Color Erase, White Line, White Marker, WPT List and Bottom Zone. For details about registration, see section 2.3. Use the **FUNC** key as follows.

1. Press the **FUNC** key to open the setting window registered; for example, Pic. Advance setting window.
2. Use **FUNC** key, ▲ or ▼ to adjust the setting and press the **ENTER** key.

1.18 Waypoints

Waypoints may be used to:

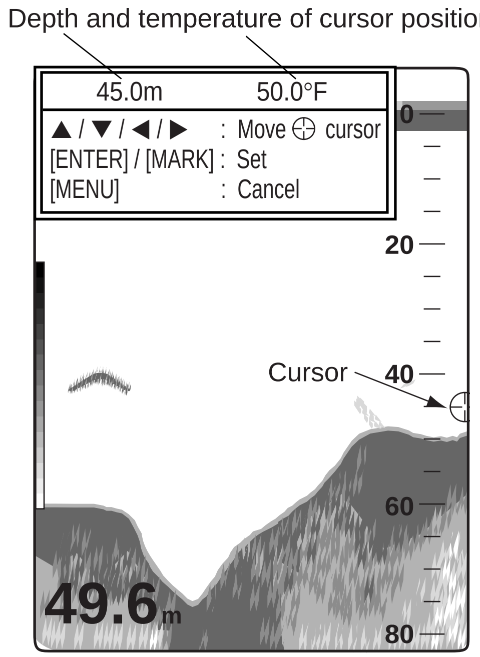
- Record the position of an important echo as waypoint. 20 points may be registered.
- Output a waypoint position to a plotter to mark position on its screen.
- Find range, bearing and time-to-go to a location (waypoint).

Note: Requires latitude and longitude position from a navigator.

1.18.1 Registering a waypoint

Registering a waypoint on the screen

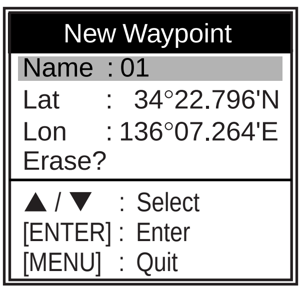
1. Press the **MARK** key.
   The cursor appears along with waypoint entry instructions. To enter a waypoint to the current own ship's position, go to step 3.



Cursor

Note: If there is no position data the message "No position data!" appears. Check the navigator.

2. Press the **TrackPad** to set the cursor where desired.
   Picture advancement is stopped until step 3 is completed, and the instruction window is integrated into the data box.
3. Press the **MARK** or **ENTER** key to register the position set at step 2.
   A red vertical line appears on the position set at step 2. The waypoint is named automatically with the next sequential waypoint number. If you want to change waypoint name, go to step 4. Otherwise, go to step 6.

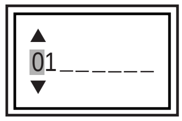


Waypoint setting window

Note1: When TLL or FURUNO-TLL is selected at TLL Output on the NMEA menu of the System menu, the latitude and longitude position at the cursor position is output to the navigator.

Note2: If you attempt to enter 21st waypoint, the message "Already entered 20 waypoints. No more waypoint can be entered." appears. In this case, erase an unwanted waypoint to enable entry. See paragraph 1.18.3 for details.

4. Press the **ENTER** key to to open the waypoint name entry box.

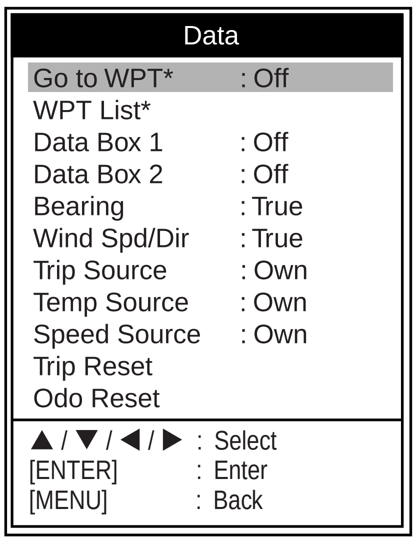


Waypoint name entry box

5. Enter the waypoint name (Max. 8 characters).
   a) Use ▲ or ▼ to set character. When pressing ▲, character order is 0 → 1 → ... → 9 → - → A → ... → Z → _ → 0 → .... When pressing ▼, character order is reverse.
   b) Use ▶ to shift cursor.
   c) Repeat step a) and b) to set the name desired and press the **ENTER** key.
6. Press the **MENU/ESC** key to close the window.

Registering a waypoint by L/L

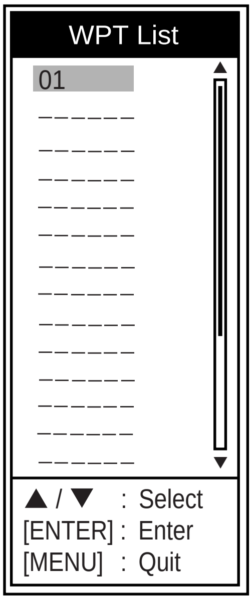
1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Data and press the **ENTER** key.



*: Go to WPT and WPT List are inoperative when no latitude and longitude position is input to the 12-24 VDC/NMEA port.

Data menu

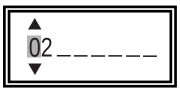
3. Use ▲ or ▼ to choose WPT List and press the **ENTER** key.



WPT List window

4. Use ▲ or ▼ to choose an empty waypoint and press the **ENTER** key.
   The Waypoint setting window appears. Lat and Lon indicate the current position.
5. Use ▲ or ▼ to choose item desired and press the **ENTER** key.
   The character setting box is shown.





For L/L *For waypoint name*

6. Enter latitude and longitude, similar to how you entered the waypoint name.
7. Press the **MENU/ESC** key four times to close the window.

1.18.2 Editing a registered waypoint

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Data and press the **ENTER** key.
3. Use ▲ or ▼ to choose WPT List and press the **ENTER** key.
4. Use ▲ or ▼ to choose a waypoint to be edited and press the **ENTER** key.
   The Edit Waypoint window is shown.
5. Use ▲ or ▼ to choose item desired and press the **ENTER** key.
6. Edit latitude and longitude, similar to how you entered the waypoint name.
7. Press the **MENU/ESC** key four times to close the window.

1.18.3 Erasing waypoint

To erase a waypoint do the following:

1. Do steps 1 through 4 in 1.18.2.
2. Use ▼ to choose the Erase? and press the **ENTER** key.
3. Use ▲ to choose Yes and press the **ENTER** key.
4. Press the **MENU/ESC** key three times to close the window.

1.18.4 Setting destination waypoint

Set a destination waypoint to find range, bearing and time-to-go to that point. Range, bearing and time-to-go (to the waypoint) are shown on the nav data display. See next section for details.

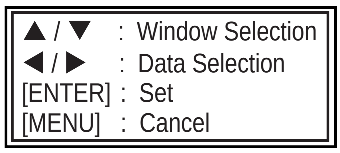
1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Data and press the **ENTER** key.
3. Use ▲ or ▼ to choose Go to WPT and press the **ENTER** key.
4. Use ▲ or ▼ to choose a destination waypoint and press the **ENTER** key.
5. Press the **MENU/ESC** key twice to close the window.

1.19 Setting Up Nav Data Displays

The user may arrange the nav data displays as desired.

1.19.1 Nav data displays

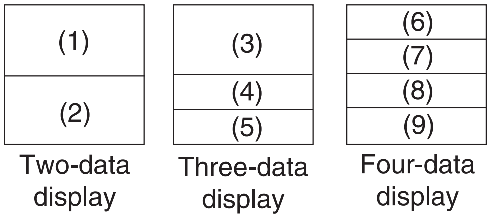
1. Rotate the **MODE** knob to choose NAV1 or NAV2.



Nav Data setting window

Note: The setting window disappears if there is no operation for about ten seconds. In this case press the **TrackPad** to re-display the window.

2. Use ▲ or ▼ to choose a data display window desired.
3. Use ◀ or ▶ to choose item to display. Items displayable depend on the screen division.



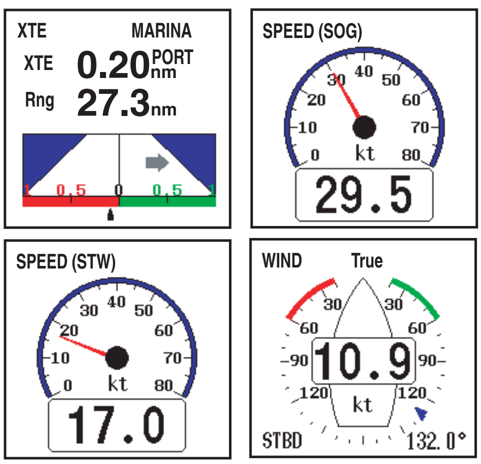
Items displayable in (1) - (3): speed (STW)*, wind speed and direction*, destination waypoint data*, compass*, heading*, depth, position, course, range and bearing, trip meter, odometer, water temperature, air pressure, time-to-go to destination waypoint, XTE*, speed (SOG)*
Items displayable in (4) - (9): depth, position, speed (SOG), speed (STW), course, range and bearing, trip meter, odometer, water temperature, heading, wind speed, wind direction, air pressure, time-to-go to destination waypoint, XTE

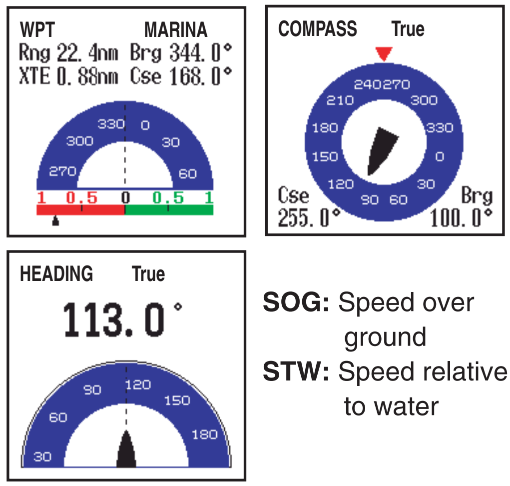
* = Graphic display

4. Press the **ENTER** key.

Note: Applicable data must be input to the 12-24 VDC/NMEA port in order to display the data mentioned in the table below.

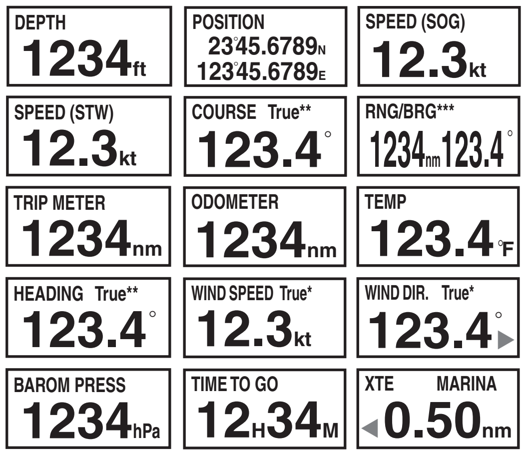
Necessary data	Item
Longitude/latitude position	Position, waypoint data, course, range and bearing, time-to-go to destination, XTE
Bearing	Compass, heading
Wind speed, wind direction, air pressure	Wind speed, wind direction, air pressure





SOG: Speed over ground
STW: Speed relative to water

Graphic displays



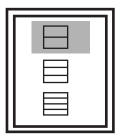
* : APP or TRUE, depending on menu setting.
** : TRUE or MAG depending on menu setting.
*** : To destination waypoint.

Digital displays

Note: When data is lost 30 sec., the display shows "- -" at the location where data is lost.

1.19.2 Screen division

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Display and press the **ENTER** key.
3. Use ▲ or ▼ to choose Nav Data 1 or Nav Data 2 and press the **ENTER** key.



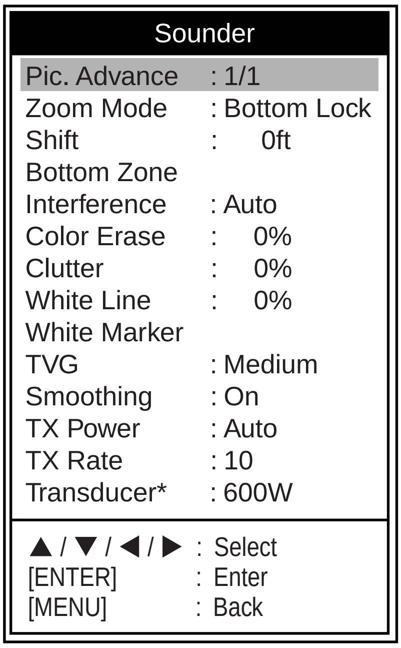
Nav Data setting box

4. Use ▲ or ▼ to choose screen division desired and press the **ENTER** key.
5. Press the **MENU/ESC** key twice to close the window.

1.20 Menu Items

This section describes menu items not previously mentioned. For the System menu, see chapter 2.

Sounder menu



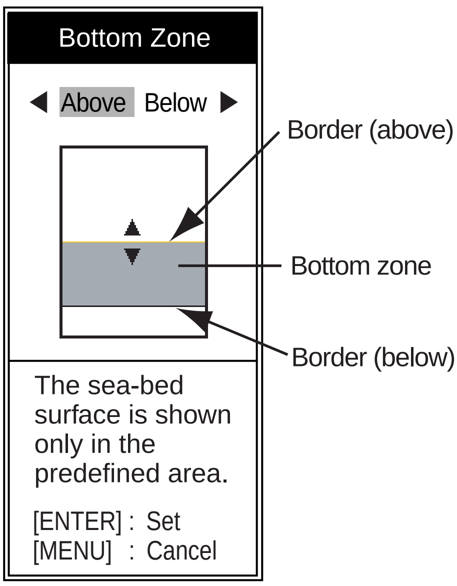
*: FCV-585 only (see section 4.10.)

Sounder menu

Zoom Mode: Choose the zoom display to show among bottom lock, bottom zoom and marker zoom when "zoom" is chosen with the MODE knob. For details, see page 3 and 4.

Bottom Zone: Set the area where to display the bottom echo when selecting Auto mode on the **RANGE** key.

1. Choose Bottom Zone in the Sounder menu and press the **ENTER** key.



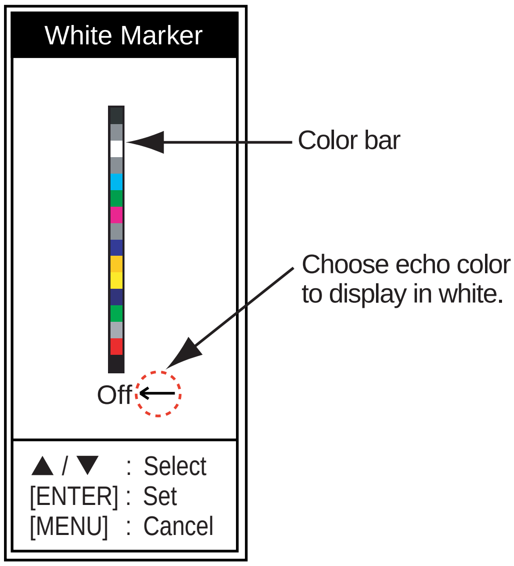
Bottom Zone setting window

2. Use ◀ or ▶ to choose the border desired (Above or Below).
3. Use ▲ or ▼ to move upper or lower border and press the **ENTER** key.

White Line: Displays the leading edge of the bottom echo in white. This is useful for discriminating bottom fish from bottom. The setting range is 0 to 50 % in intervals of five. The larger the numeric, the wider the white line width.

White Marker: Displays the chosen echo color in white.

1. Choose White Marker in the Sounder menu and press the **ENTER** key.



White Marker setting window

2. Use ▲ or ▼ to choose color desired and press the **ENTER** key.
   For example, move the arrow to the top of the color bar to display the bottom in white. The echo color chosen on the color bar is changed to white. That color is also white on the color bar.

To turn off the white marker, choose Off at step 2.

TVG: The fish schools of the same size are displayed in different color between in deep water and in shallow water because of the feature of the ultrasonic waves. TVG compensates for propagation attenuation of the ultrasonic waves. It does this by equalizing echo presentation so that fish schools of the same size appear in the same density in both shallow and deep waters. The gain is adjusted automatically depending on the depth. The gain is low at short distance and getting back with increasing distance. High provides the greatest degree of gain reduction

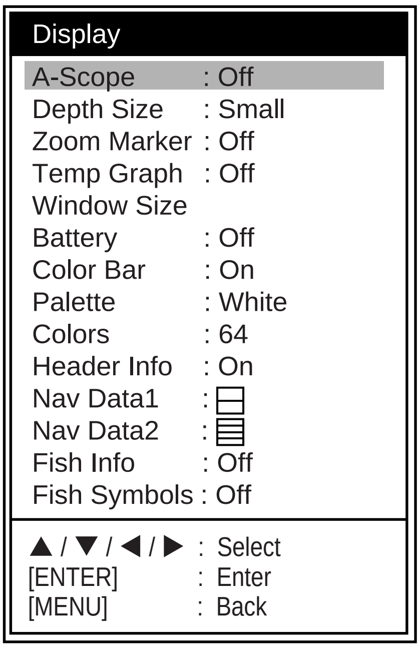
against short range echoes. Note that this function is operative when manual is selected on the **GAIN** knob.

Smoothing: Smoothes echo presentation when enabled. Adjust the setting when echoes appear "spotty".

TX Power: Interference may appear on the screen when an echo sounder having the same frequency as your own is being operated in the vicinity of your vessel. In this case, lower your TX power and contact the vessel to request them to reduce their TX power. The higher the numeric the greater the TX power. The "Auto" setting automatically adjusts TX power with depth. Note that this function is only operative when Fish Info and Fish Symbols in the Display menu are off. When Fish Info and Fish Symbols are on, the TX power mode is "Auto".

TX Rate: Changes pulse repetition rate. Normally, the highest rate (10) is used. When in shallow waters second reflection echoes may appear between surface and actual bottom echo. In this case, lower the TX rate level.
The choice "S" means the ship's speed dependent mode, where the TX rate changes automatically with ship's speed. (Requires ship's speed input.)

Display menu

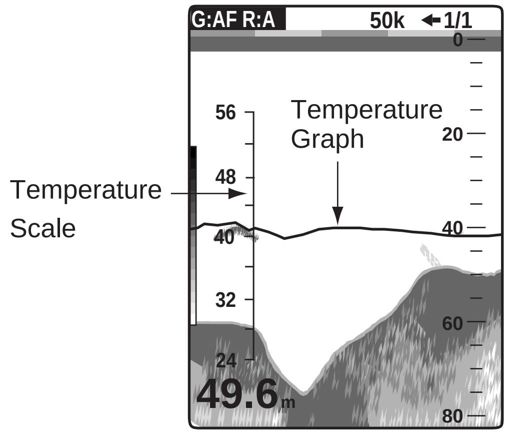


Display menu

Depth Size: Choose the font size of the depth indication (Small, Medium or Large).

Zoom Marker: Turn the zoom marker on or off (on the single frequency display) when the bottom lock display, the bottom zoom display or the marker zoom display is selected.

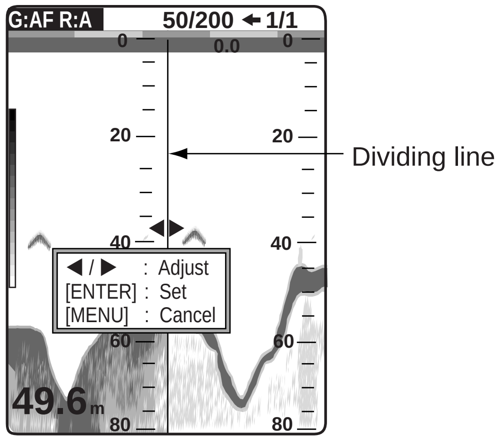
Temp Graph: Turn the water temperature graph on or off. The temperature scale range is 16° (°F) in "Narrow", 32° (°F) in "Wide". Requires water temperature data.



Temperature graph

Window Size: Adjust the display area of the dual frequency mode or zoom mode. Note that this function is inoperative with single frequency, nav data mode or A-Scope display.

1. Choose Window Size in the Display menu and press the **ENTER** key.



Window size setting window

2. Use ◀ or ▶ to move the dividing line and press the **ENTER** key.

Battery: Turn the battery voltage indication (appears at the top right corner on the screen) on or off. When on it replaces the picture advance speed indication.

Color Bar: Turn the color bar on or off.

Palette: Change the background color of the screen in five colors: white, blue, black, gray and night.

Colors: Choose the number of colors to use: 8, 16 or 64.

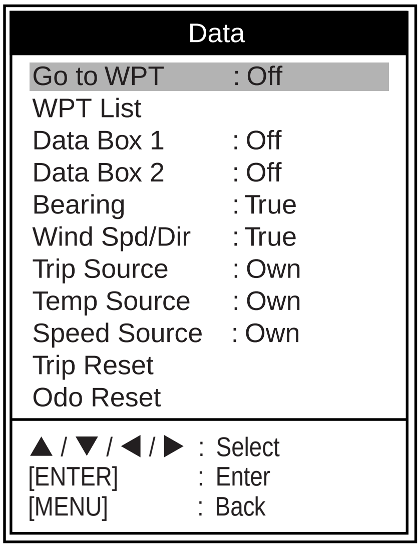
Header Info: Turn the data area indication (appears at the top on the screen) on or off.



Data area

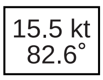
Data menu

This menu mainly sets up how to display data input by external equipment.



Data menu

Data Box 1, 2: Data for speed (SOG), speed (STW), depth, range, bearing, position, wind, heading, course, barom press, water temperature, time to go, trip meter, odometer or XTE can be displayed on the left top of the screen. Appropriate sensor is required to display data other than depth.



Data box

Bearing: Ship's course and heading may be displayed in true or magnetic bearing. Magnetic bearing is true bearing plus (or minus) earth's magnetic deviation. Requires bearing data.

Wind Spd/Dir: Choose the wind speed and direction reference from true and apparent. Requires wind sensor.

Apparent: The direction (in relation to ship's heading) and speed of the wind as it appears to those on board, relative to the speed and direction of the boat; combination of the true wind and the boat's movement.

True: The speed and direction (in relation to ship's heading) of the wind felt or measured when stationary.

Trip Source: Choose speed source for the trip distance indication: Off, Own (speed sensor connected to the FCV-620/585) or NMEA (speed data from external equipment).

Temp Source: Choose source of water temperature input; Off, Own (temperature sensor connected to the FCV-620/585) or NMEA (speed data from external equipment).

Speed Source: Choose source of speed input; Off, Own (speed sensor connected to the FCV-620/585) or NMEA (speed data from external equipment).

Trip Reset: Choose Yes to reset the trip distance to zero. Beeps are generated while the trip distance is being reset.

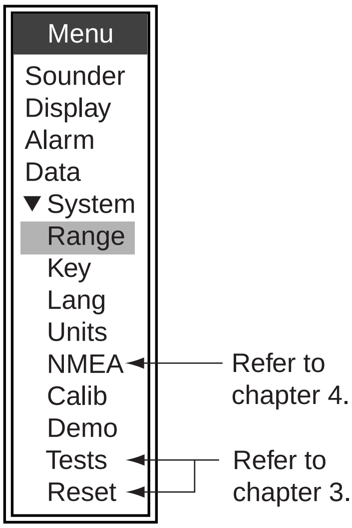
Odo Reset: Choose Yes to reset the odometer to zero. Beeps are generated while the odometer is being reset.

2. SYSTEM MENU

2.1 Displaying System Sub Menu

The System menu mainly consists of items which once set do not require frequent adjustment. This menu has nine sub menus. To display each sub menu, do the followings.

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose System.
   The list of sub menus appears below System.



System menu

2.2 Range Menu

Range		
Range 1	:	15ft
Range 2	:	30ft
Range 3	:	60ft
Range 4	:	120ft
Range 5	:	200ft
Range 6	:	400ft
Range 7	:	600ft
Range 8	:	1000ft
Zoom Range	:	15ft
B/L Range	:	15ft
▲/▼/◀/▶	:	Select
[ENTER]	:	Enter
[MENU]	:	Back

Range menu

Range 1 - Range 8: Set range of each of the eight ranges (selectable range: 7 to 2,500 ft).

Note that all default ranges are restored whenever the depth unit is changed. Therefore, change the depth unit before changing the preset ranges.

Zoom Range: Choose the range to zoom in the bottom zoom and marker zoom modes. You may choose a range between 7 and 2,500 feet.

B/L Range: Choose the expansion width for the bottom lock display from 10 to 30 feet.

2.3 Key Menu

Key		
FUNC Key	:	Pic. Advance
Key Beep	:	On
▲/▼/◀/▶	:	Select
[ENTER]	:	Enter
[MENU]	:	Back

Key menu

FUNC Key: Register the item for instant display of a user-defined options window. Nine items are available: Pic Advance (default), Shift, Interference, Clutter, Color Erase, White Line, White Marker, WPT List and Bottom Zone.

You may program the **FUNC** key to display the options window of your choice.

1. Long-press the **FUNC** key to open the FUNC Key setting window.
2. Use ▲ or ▼ to choose function item desired and press the **ENTER** key.

Key Beep: Turn key beep on or off.

2.4 Lang Menu

Language		
Language	:	English
▲/▼/◀/▶	:	Select
[ENTER]	:	Enter
[MENU]	:	Back

Lang menu

Language: The system language is available in English, several European languages and

Japanese. To change language, select language desired and press the **ENTER** key.

2.5 Units Menu

Units	
Depth	: ft
Temp	: °F
Fish Size	: inch
Speed	: kt
Wind	: kt
Distance	: nm
▲/▼/◀/▶	: Select
[ENTER]	: Enter
[MENU]	: Back

Units menu

Depth: Choose unit of depth measurement from m, ft, fa, pb or HR (Japanese).

Temp: Choose unit of temperature measurement from °C or °F. Temperature data is required.

Fish Size: Choose unit of fish size measurement from inch or cm.

Speed: Choose unit of speed measurement from kt, km/h or mph. Speed data is required.

Wind: Choose unit of wind speed measurement from kt, km/h, mph or m/s. Wind speed data is required.

Distance: Choose unit of distance measurement from nm, km or sm.

2.6 Calib Menu

Calibration	
Draft	: + 0.0 ft
Gain ADJ 200	: + 0
Gain ADJ 50	: + 0
Temp	: + 0.0 °F
Speed (STW)	: + 0%
Fish Size	: + 0%
Water Type	: Salt
Zero Line	
Rejection	: On
Area	: 4.5ft
▲/▼/◀/▶	: Select
[ENTER]	: Enter
[MENU]	: Back

Calib menu

Draft: The default depth display shows the distance from the transducer. If you would rather show the distance from the sea surface, set your ship's draft (setting range: -15.0 to +50.0 ft).

Gain ADJ 200, Gain ADJ 50: If the gain is too high or too low, or the gain for the low and high frequencies appears unbalanced, you can compensate it (setting range: -20 to +20).

Temp: If the water temperature indication has error, you can correct it here. For example, if the water temperature indication is 2° higher than actual water temperature, enter -2. The setting range is -20.0 to +20.0 °F.

Speed (STW): If the speed indication has error, you can correct it here. For example, if the speed indication is 10 % lower than actual speed, enter +10. The setting range is -50 to +50 %.

Fish Size: Compensate for wrongful indication of fish size (setting range: -80 to +100 %).

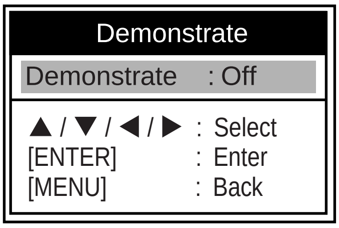
Compensation size	Setting value
Double	+100 %
1.5	+50 %
1/2	-50 %
1/3	-65 %
1/4	-75 %
1/5	-80 %

Water Type: Choose the water type with which to use the FCV-620/585, from Salt or Fresh. Choose correct water type to get accurate depth data.

Zero Line Rejection: Turn the zero line (transmission line) on or off. When turned on, the transmission line disappears, which allows you to better watch fish echoes near the surface. The length of the transmission line changes with transducer used and installation characteristics. If the width of the transmission line is 4.5 ft (default value) or more, set the transmission line width with Zero Line Area, as below.

Zero Line Area: This feature adjusts the transmission line so that the transmission line disappears when the menu item Zero Line Rejection is turned on. The effective range is 4.5 to 9.8 ft. For a long tail, increase the value. If the transmission line does not disappear, lower the Tx power.

2.7 Demo Menu



Demo menu

Demonstrate: The demonstration mode provides, without connection of the transducer, simulated operation of the equipment, using internally generated echoes. All controls are operative. The message “DEMO” appears at the bottom right corner on the screen when the demonstrate mode is active.
Off: Turn demo mode off.
Demo1: Shallow depth demonstration
Demo2: Deep depth demonstration

3. MAINTENANCE, TROUBLE-SHOOTING

⚠ WARNING

ELECTRICAL SHOCK HAZARD
Do not open the equipment.

Only qualified personnel should work inside the equipment.

IMPORTANT

Do not apply paint, anti-corrosive sealant or contact spray to coating or plastic parts.

Those items contain organic solvents that can damage coating and plastic parts, especially plastic connectors.

3.1 Maintenance

Regular maintenance is essential for good performance. Checking the items listed in the table below monthly will help keep your equipment in good shape for years to come.

Checking

Item	Action
Transducer cable	Check cable for damage.
Power cable, transducer cable plug	Check that they are tightly fastened. Refasten if necessary.
Display unit ground	Check for corrosion. Clean if necessary.
Power supply voltage	Check voltage. If out of rating correct problem.

3.2 Cleaning the Display Unit

Dust or dirt may be removed from the cabinet with a soft cloth. Water-diluted mild detergent may be used if desired. DO NOT use chemical cleaners to clean the display unit; they may remove paint and markings. Wipe the LCD carefully to prevent scratching, using tissue paper and an LCD cleaner. To remove dirt or salt deposits, use an LCD cleaner, wiping slowly with tissue paper so as to dissolve the dirt or salt. Change paper frequently so the salt or dirt will not scratch the LCD. Do not use solvents such as thinner, acetone or benzene for cleaning. Also, do not use degreaser or antifog solution, as they can strip the coating from the LCD.

3.3 Transducer Maintenance

Marine life on the transducer face will result in a gradual decrease in sensitivity. Check the transducer face for cleanliness each time the boat is dry-docked. Carefully remove any marine life with a piece of wood or fine-grade sandpaper.

3.4 Replacing the Fuse

The fuses (Type: FGBO-A 125V 2A, Code No.: 000-155-849-10) in the power cable protect the system from reverse polarity of the power supply and equipment fault. If a fuse blows, find the cause before replacing it. Using the wrong fuse will damage the unit and void the warranty.

⚠ WARNING

Use the proper fuse.

Fuse rating is shown on the cable.
Use of a wrong fuse can result in fire and damage the equipment.

3.5 Battery Voltage Alert

A battery icon appears when the battery voltage is too high or too low.

Battery icon and meaning

Icon	Meaning
	Voltage is lower than 10 VDC. If the voltage goes below 9 V, the equipment is automatically turned off.
	Voltage is higher than 32 VDC. If the voltage goes higher than 33 V, the equipment is automatically turned off.

3.6 Troubleshooting

The table below provides basic trouble-shooting procedures which the user may follow to restore normal operation.

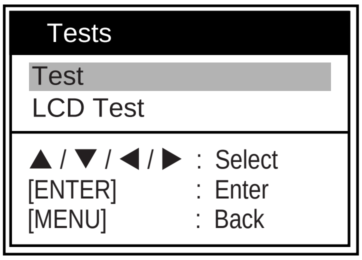
Troubleshooting table

If...	then check...
neither echo nor fixed range scale appears	• battery voltage. • fuse. • power supply. • power cable.
no echo appears but the fixed range scale appears	• if display advance speed is not set to "Stop." • transducer plug. • transducer cable.
echo appears but no zero line	• if range shifting is set to "0." • if zero line rejection is off.
sensitivity is low	• gain setting. • if air bubbles or marine life is not clinging to the transducer face. • if sediments are not present in the water. • if the bottom is too soft to return an echo.
there is extreme interference or noise	• if the transducer is too close to the engine. • if the unit is properly grounded. • if other echo sounders of the same frequency as own are being operated nearby.
the speed/water temperature readout is unrealistic or not present	• sensor plug.
the position readout is unrealistic or not present	• the connection between sounder and navigator. • navigator.

3.7 Diagnostics

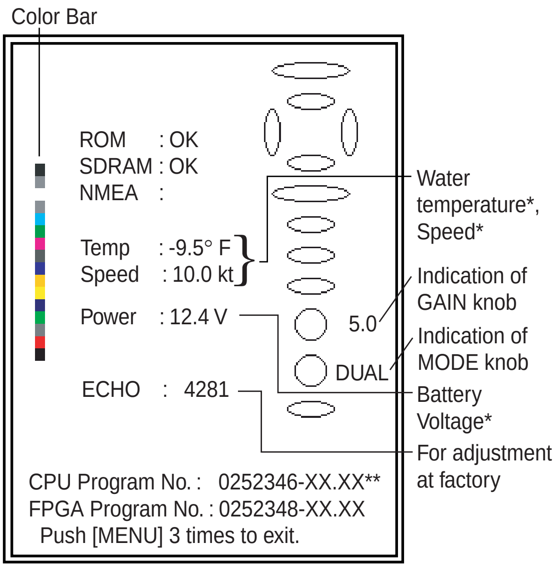
If you feel your unit is not working properly, conduct the diagnostic test to find the problem. If you cannot restore normal operation, contact your dealer for advice.

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Tests under System and press the **ENTER** key.



Tests menu

3. Use ▲ or ▼ to choose Test and press the **ENTER** key.



*: Updated every second.
XX: Program version number
**: FCV-620: 0252346-XX.XX
FCV-585: 0252347-XX.XX

Test display

The ROM, SDRAM and NMEA port are checked, with the results shown as OK or NG (No Good). For any NG, request service. (A special connector is required to test the NMEA port. Nothing appears if no connector is connected.)

4. The ovals and circles at the right side of the test display are for checking the controls. **Checking key and TrackPad**: Press each key and the arrows on the TrackPad one by one. A control's corresponding on-screen oval "lights" in red if the control is normal.

Checking GAIN knob: Rotate the knob. The indication goes higher with clockwise rotation; lower with counterclockwise rotation. Press the knob. The knob corresponding on-screen circle "lights" in red if the knob is normal.
Checking MODE knob: Rotate the knob, and corresponding on-screen circle "lights" in red and white alternately.

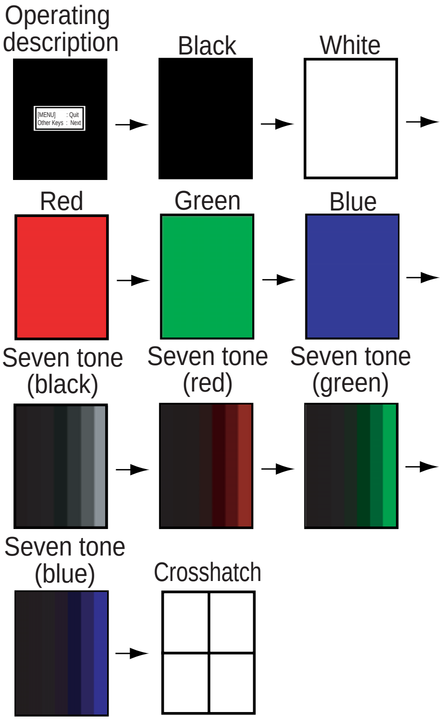
5. To return to the Tests menu, press the **MENU/ESC** key three times.
6. Press the **MENU/ESC** key twice to close the window.

3.8 Test Pattern

This feature tests for proper display of LCD.

Note: To review the seven tone screen easily, set contrast (FCV-620 only) and brilliance to maximum before starting the test.

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Tests under System and press the **ENTER** key.
3. Use ▲ or ▼ to choose LCD Test and press the **ENTER** key.
4. Press any key except **MENU/ESC** key to start the test.
   The entire screen changes as below with each press of any key except **MENU/ESC** key. After crosshatch screen, the Tests menu appears.



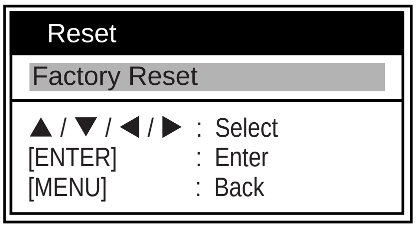
LCD test pattern

5. Press the **MENU/ESC** key twice to close the window.

3.9 Memory Clear

The memory can be cleared to start afresh with default menu settings except for language setting.

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose Reset under System and press the **ENTER** key.



Reset menu

3. Confirm Factory Reset is selected and press the **ENTER** key.



Reset setting box

4. Use ▲ to choose Yes and press the **ENTER** key.
   After the memory is cleared, the unit beeps and the installation menu appears (see page 2).
5. Press the **MENU/ESC** key twice to close the window.

4. INSTALLATION

4.1 Display Unit

Mounting considerations

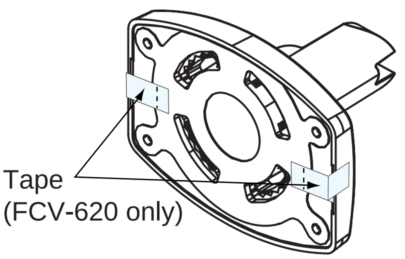
The display unit can be installed on a tabletop or flush mounted in a panel. When choosing a location keep the following in mind:

- The temperature and humidity should be moderate and stable.
- Locate the unit away from exhaust pipes and vents.
- The mounting location should be well ventilated.
- Mount the unit where shock and vibration are minimal.
- For maintenance and checking purposes, leave sufficient space at the sides and rear of the unit and leave slack in cables.
- A magnetic compass will be affected if the display unit is placed too close to it. Observe the following compass safe distances to prevent disturbance to the magnetic compass:

  Standard compass
  FCV-620: 0.3 m, FCV-585: 0.5 m
  Steering compass
  FCV-620: 0.3 m, FCV-585: 0.3 m

Tabletop mounting

1. Remove the tape from the bottom of the bracket assembly.



Bottom of the bracket

2. Fix the bracket assembly to a tabletop with four self-tapping screws (5x25, supplied).
3. Loosely screw knob into the bracket assembly.
4. Set the display unit to the bracket assembly.
5. Adjust the angle of the display unit and then tighten the knob to fix the display unit.

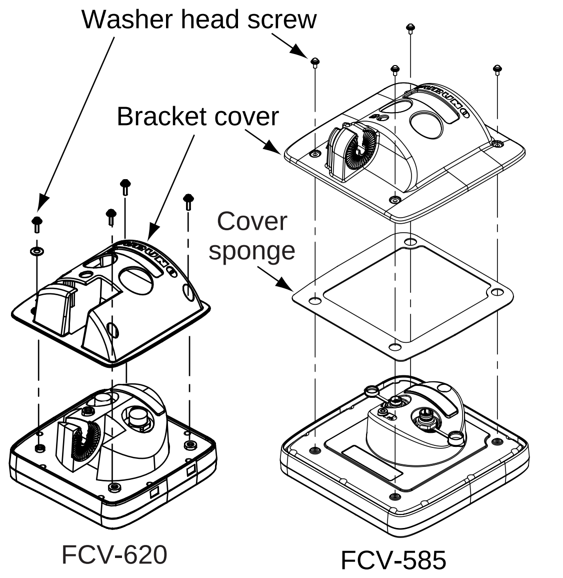
Note: When loosening the knob to adjust the angle of the display, do not decline the unit 90-degree backward. The cable connector may be damaged if it contacts the bracket.

6. Attach the hard cover to the display unit.

Flush mounting in a panel

Note: It is recommended to set up a dedicated breaker when flush mounting the unit, since it will be difficult to disconnect cables.

1. Using the paper template (supplied), make a cutout in the mounting location.
2. Loosen four washer head screws on the rear of the display unit to remove the bracket cover and the cover sponge (FCV-585 only).



How to remove the bracket cover

3. Set the flush mounting sponge (supplied) to the display unit.
4. Screw four threaded rods (M4x50, supplied) to the display unit.
5. Set the display unit to the cutout.
6. Fasten the display unit from behind with four sets of flat washer, spring washer and wing nut (supplied).

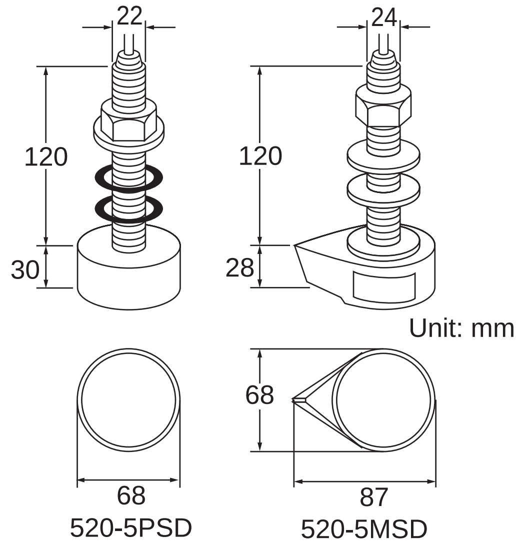
4.2 Thru-hull Mount Transducer

Transducer mounting location

The thru-hull mount transducer (520-5PSD, 520-5MSD) provides the best performance of all, since the transducer protrudes from the hull and the effect of air bubbles and turbulence near the hull skin is reduced. When the boat has a keel, the transducer should be at least 30 cm away from it. Typical thru-hull mountings are shown in the figure on the next page.

The performance of this sounder is directly related to the mounting location of the transducer, especially for high-speed cruising. The installation should be planned in advance, keeping the standard cable length (8 m) and the following factors in mind:

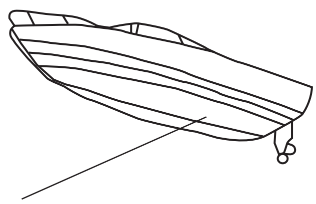
- Air bubbles and turbulence caused by movement of the boat seriously degrade the sounding capability of the transducer. The transducer should, therefore, be located in a position where water flow is the smoothest. Noise from the propellers also adversely affects performance and the transducer should not be mounted nearby. The lifting strakes are notorious for creating acoustic noise, and these must be avoided by keeping the transducer inboard of them.
- The transducer must always remain submerged, even when the boat is rolling, pitching or up on a plane at high speed.
- A practical choice would be somewhere between 1/3 and 1/2 of the boat's length from the stern. For planing hulls, a practical location is generally rather far astern, so that the transducer is always in water regardless of the planing attitude.



Thru-hull mount transducer mounting dimensions (millimeters)

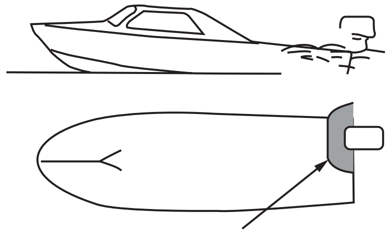
Acceptable transducer mounting locations

DEEP-V HULL



- Position 1/2 to 1/3 of the hull from stern.
- 15 to 30 cm off center line (inside first lifting strakes.)

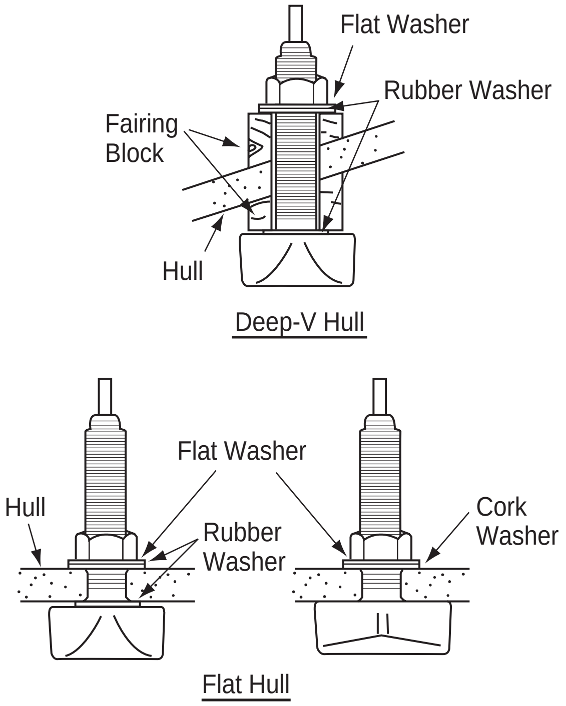
HIGH SPEED-V HULL



- Within the wetted bottom area
- Deadrise angle within 15°

Suitable transducer mounting locations

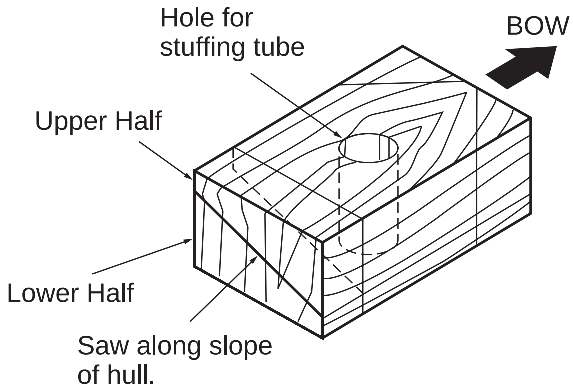
Typical thru-hull mount transducer installations



Typical thru-hull mount transducer installations

Procedure for installing the thru-hull mount transducer

1. With the boat hauled out of the water, mark the location chosen for mounting the transducer on the bottom of the hull.
2. If the hull is not level within 15° in any direction, fairing blocks made out of teak should be used between the transducer and hull, both inside and outside, to keep the transducer face parallel with the water line. Fabricate the fairing block as shown below and make the entire surface as smooth as possible to provide an undisturbed flow of water around the transducer. The fairing block should be smaller than the transducer itself to provide a channel to divert turbulent water around the sides of the transducer rather than over its face.



Construction of fairing block

3. Drill a hole just large enough to pass the threaded stuffing tube of the transducer through the hull, making sure it is drilled vertically.
4. Apply a sufficient amount of high quality caulking compound to the top surface of the transducer, around the threads of the stuffing tube and inside the mounting hole (and fairing blocks if used) to ensure watertight mounting.
5. Mount the transducer and fairing blocks and tighten the locking nuts. Be sure that the transducer is properly oriented and its working face is parallel to the waterline.

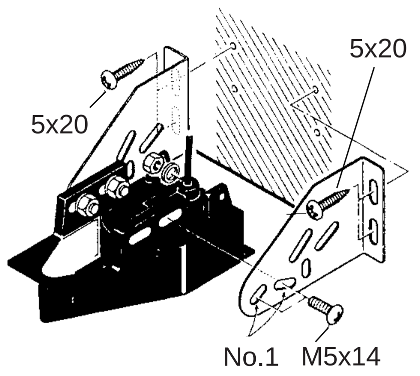
Note: Do not over-stress the stuffing tube and locking nuts through excessive tightening, since the wood block will swell when the boat is placed in the water. It is suggested that the nut be tightened lightly at installation and retightened several days after the boat has been launched.

Transducer preparation

Before putting the boat in water, wipe the face of the transducer thoroughly with a detergent liquid soap. This will lessen the time necessary for the transducer to have good contact with the water. Otherwise the time required for complete "saturation" will be lengthened and performance will be reduced.
DO NOT paint the transducer. Performance will be affected.

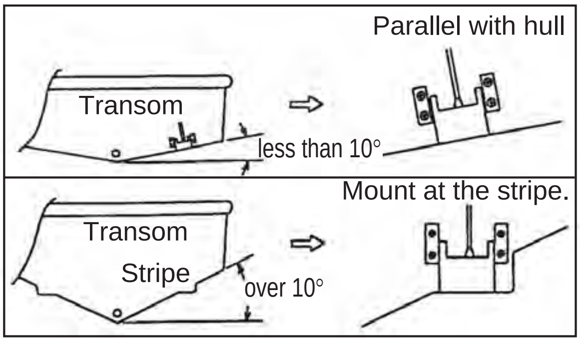
4.3 Transom Mount Transducer

The transom mount transducer is very commonly employed, usually on relatively small I/O or outboard boats. Do not use this method on an inboard motor boat because turbulence is created by the propeller ahead of the transducer.
DO NOT overtighten screws. They may be damaged.

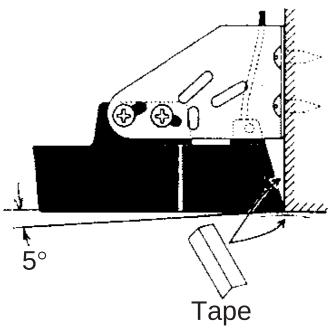


525-5PWD

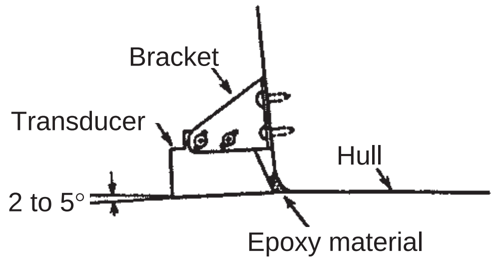
Choose the installation method depending on the rise angle of the hull.



525-5PWD mounting locations



Transom mount transducer, mounting flush with hull



525-5PWD, mounting

<u>Installing the 525-5PWD</u>

A suitable mounting location is at least 50 cm away from the engine and where the water flow is smooth.

1. Drill four pilot holes for self-tapping screw (5x20) in the mounting location.
2. Attach the transducer to the mounting location with self-tapping screws.
3. Adjust the transducer position so the transducer faces right to the bottom.
   If necessary, to improve water flow and minimize air bubbles staying on the transducer face, incline the transducer about 5° at the rear. This may require a certain amount of experimentation for fine tuning at high cruising speeds.
4. Fill the gap between the wedge front of the transducer and transom with epoxy material to eliminate any air spaces.

4.4 Inside-hull Transducer

The thru-hull mount transducer (520-5PSD, 520-5MSD) may also be installed inside the hull, following the procedure below.

Necessary tools

You will need the following tools:

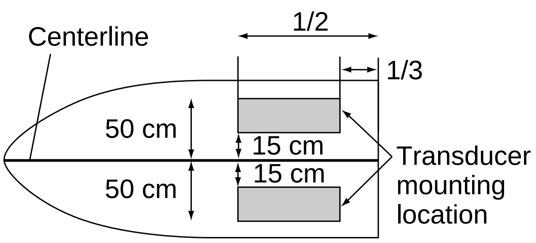
- Sandpaper (#100)
- Silicone sealant
- Silicone grease

Remarks on installation

- Turn off the engine and anchor the boat while installing the equipment.
- Install the transducer in the engine room.
- Except for installing the transducer to the bottom of hull, do not turn on its power so it may be damaged.

Choosing the mounting location

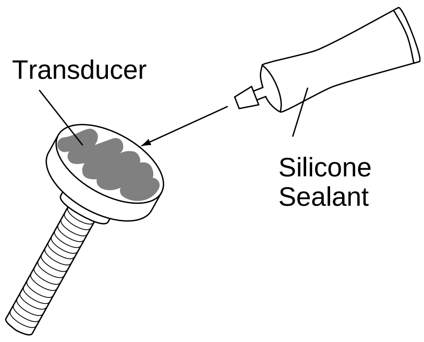
- The mounting location should be where the hull is of single-hull thickness and is void of air or flotation materials other than solid fiberglass between the transducer face and the water.
- The mounting location is between 15 to 50 cm from the centerline of the hull.
- Do not place the transducer over hull struts or ribs which run under the hull.
- Avoid a location where the rising angle of the hull exceeds 15°, to minimize the effect of the boat's rolling.
- You will finalize the mounting location through some trial and error. The procedure for this is shown later.



Inside-hull transducer mounting location

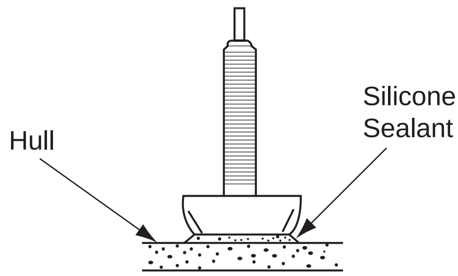
Attaching the transducer

1. Clean the transducer face to remove any foreign material. Lightly roughen the transducer face with #100 sandpaper. Also, roughen the inside of the hull where the transducer is to be mounted.
2. Clean the transducer face again to remove scourings.
3. Warm the silicone sealant to 40°C before usage to soften it. Coat the transducer face and mounting location with silicone sealant.



Coating transducer face with silicone sealant

4. Press the transducer firmly down on the hull and gently twist it back and forth to remove any air which may be trapped in the silicone sealant.



Checking the installation

1. Connect the battery to the display unit.
2. Turn on the display unit.
3. Rotate the **MODE** knob to choose single frequency (**LF:** 50 kHz or **HF:** 200 kHz).
4. Press the **GAIN** knob to open the Auto Gain setting window.
5. Press the **GAIN** knob to choose Off and press the **ENTER** key.
6. Rotate the **GAIN** knob to set the gain to "5".
7. Press the **RANGE** key to open the Range setting window.
8. Use ▶ to choose Manual.
9. Press the **RANGE** key continuously to set the range to 10 meters (feet) and press the **ENTER** key.
10. If the bottom is displayed in reddish brown and the depth indication appears, the mounting location is suitable. Go to "Final preparation."
11. If the bottom is not displayed in reddish brown, the mounting location may be unsuitable. Do the following:

    a) Press the ⏻ **/BRILL** key to turn off the power.

b)Gently dismount the transducer with a knife or a piece of wood.
c)Reattach the transducer elsewhere as shown in "Attaching the transducer."
d)Check the installation again.

Final preparation

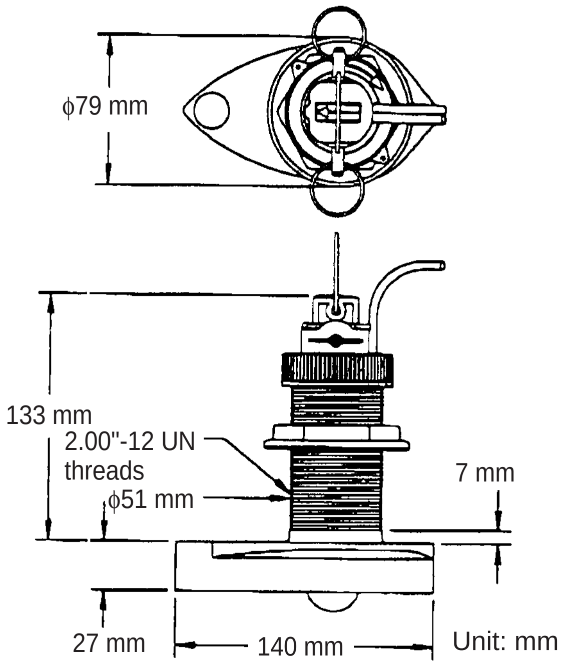
Support the transducer with a piece of wood to keep it in place while it is drying. Let the transducer dry 24-72 hours.

4.5 Triducer

DO NOT overtighten screws. They may be damaged.

525ST-MSD

The triducer 525ST-MSD is designed for thru-hull mounting. For how to install this triducer see paragraph 4.2.



Triducer 525ST-MSD

525ST-PWD

The transom mount triducer with integral release bracket 525ST-PWD is manufactured by AIRMAR Co. These instructions are also included with the sensor.

Pre-test for speed and temperature

Connect the sensor to the instrument and spin the paddlewheel. Check for a speed reading and the approximate air temperature. If there is no reading, return the sensor to your place of purchase.

Tools and materials needed

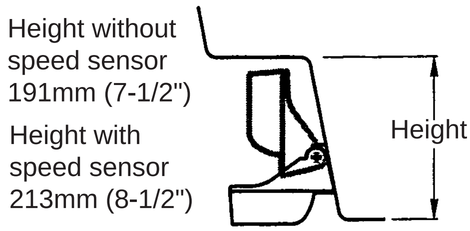
Scissors
Masking tape
Safety goggles
Dust mask
Electric drill
Drill bit for:
- Bracket holes: 4mm, #23, or 9/64"
- Fiberglass hull: chamfer bit (preferred), 6mm, or 1/4"
- Transom hole: 19mm or 3/4" (optional)
- Cable clamp holes: 3mm or 1/8"

Screwdrivers
Straight edge
Marine sealant
Pencil
Zip-ties
Water-based antifouling paint (mandatory in salt water).

Mounting location

To ensure the best performance, the sensor must be submerged in aeration-free and turbulence-free water. Mount the sensor close to the centerline of the boat. On slower heavier displacement hulls, positioning it farther from the centerline is acceptable.

Allow adequate space above the bracket for it to release and rotate the sensor upward.

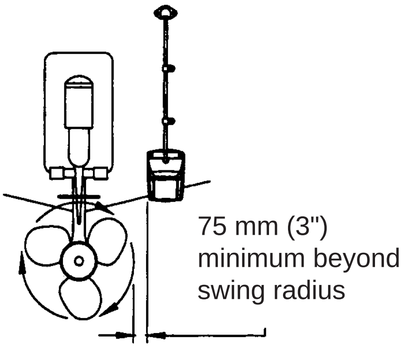


Height required at mounting location

Note 1: Do not mount the sensor in an area of turbulence or bubbles: near water intake or discharge openings; behind strakes, struts, fittings, or hull irregularities; behind eroding paint (an indication of turbulence).

Note 2: Avoid mounting the sensor where the boat may be supported during trailering, launching, hauling, and storage.

Note 3: For single drive boat, mount on the starboard side at least 75 mm (3") beyond the swing radius of the propeller.

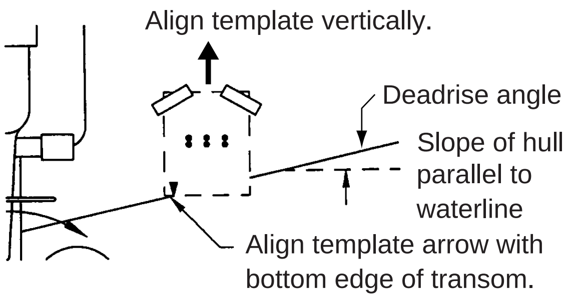


Mounting location on single drive boat

Note 4: For twin drive boat, mount between the drives.

Installation of bracket

1. Cut out the installation template (enclosed with transducer) along the dotted line.
2. At the selected location, position the template, so the arrow at the bottom is aligned with the bottom edge of the transom. Being sure the template is parallel to the waterline, tape it in place.



Positioning the template

Warning: Always wear safety goggles and a dust mask.

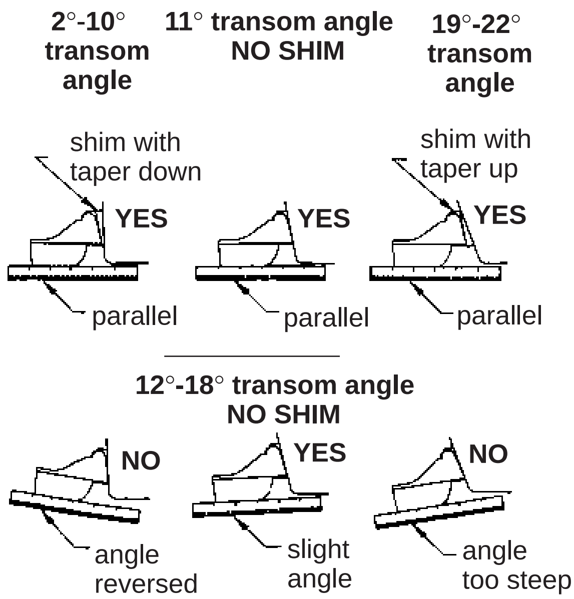
3. Using a 4 mm, #23, or 9/64" bit, drill three holes 22 mm (7/8") deep at the locations indicated. To prevent drilling too deeply, wrap masking tape around the bit 22 mm (7/8") from the point.
   Fiberglass hull: Minimize surface cracking by chamfering the gelcoat. If a chamfer bit or countersink bit is not available, start drilling with a 6mm or 1/4" bit to a depth of 1 mm (1/16").
4. If you know your transom angle, the bracket is designed for a standard 13° transom angle.
   11°-18° angle: No shim is required. Skip to step 3 in "Adjusting".
   Other angles: The shim is required. Skip to step 2 of "Adjusting".
   If you do not know the transom angle, temporarily attach the bracket and sensor to the transom to determine if the plastic shim is needed.
5. Using the three #10 x 1-1/4" self-tapping screws, temporarily screw the bracket to the hull. DO NOT tighten the screws completely at this time. Follow the step 1-4 in "Attaching the sensor to the bracket", before proceeding with "Adjusting".

Adjusting

1. Using a straight edge, sight the underside of the sensor relative to the underside of the hull. The stern of the sensor should be 1-3 mm (1/16-1/8") below the bow of the sensor or parallel to the bottom of the hull.

Note: Do not position the bow of the sensor lower than the stern because aeration will occur.

2. To adjust the sensor's angle relative to the hull, use the tapered plastic shim provided. If the bracket has been temporarily fastened to the transom, remove it. Key the shim in place on the back of the bracket.
   2°-10° transom angle (stepped transom and jet boats): Position the shim with the tapered end down.
   19°-22° transom angle (small aluminum and fiberglass boats): Position the shim with the tapered end up.

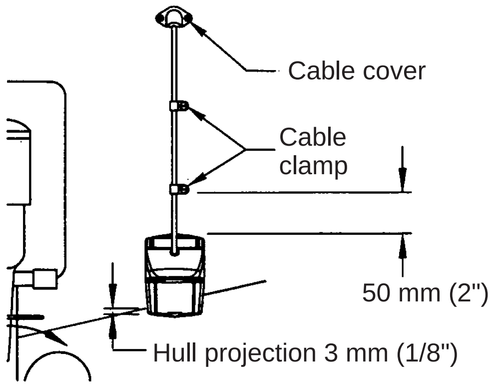


Sensor position and transom angle

3. If the bracket has been temporarily fastened to the transom, remove it. Apply a marine sealant to the threads of the three #10 x 1-1/4" self tapping screws to prevent water seeping into the transom. Screw the bracket to the hull. Do not tighten the screws completely at this time.
4. Repeat step 1 to ensure that the angle of the sensor is correct.

Note: Do not position the sensor farther into the water than necessary to avoid increasing drag, spray, and water noise and reducing boat speed.

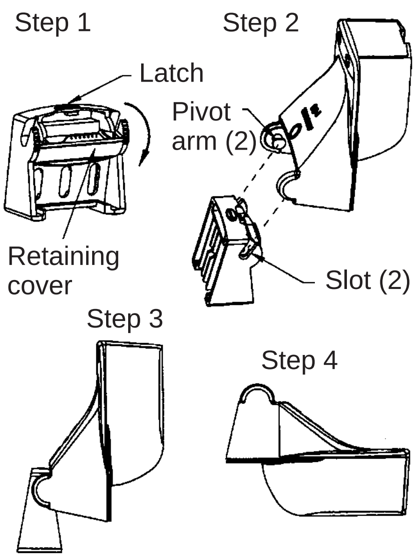
5. Using the vertical adjustment space on the bracket slots, slide the sensor up or down to provide a projection of 3 mm (1/8”). Tighten the screws.



Vertical adjustment and cable routing

Attaching the sensor to the bracket

1. If the retaining cover near the top of the bracket is closed, open it by depressing the latch and rotating the cover downward.



Attaching the sensor to the bracket

2. Insert the sensor's pivot arms into the slots near the top of the bracket.
3. Maintain pressure until the pivot arms click into place.
4. Rotate the sensor downward until the bottom snaps into the bracket.
5. Close the retaining cover to prevent the accidental release of the sensor when the boat is underway.

Cable routing

Route the sensor cable over the transom, through a drain hole, or thorough a new hole drilled in the transom above the waterline.

Never cut the cable or remote the connector; this will void the warranty. Always wear safety goggles and a dust mask.

1. If a hole must be drilled, choose a location well above the waterline. Check for obstructions such as trim tabs, pumps, or wiring inside the hull. Mark the location with a pencil. Drill a hole through the transom using a 19 mm or 3/4" bit (to accommodate the connector).
2. Route the cable over or through the transom.
3. On the outside of the hull secure the cable against the transom using the cable clamps. Position a cable clamp 50 mm (2") above the bracket and mark the mounting hole with a pencil.
4. Position the second cable clamp halfway between the first clamp and the cable hole. Mark this mounting hole.
5. If a hole has been drilled in the transom, open the appropriate slot in the transom cable cover. Position the cover over the cable where it enters the hull. Mark the two mounting holes.
6. At each of the marked locations, use a 3 mm or 1/8" bit to drill a hole 10 mm (3/8") deep. The prevent drilling too deeply, wrap masking tape around the bit 10 mm (3/8") from the point.
7. Apply marine sealant to the threads of the #6 x 1/2" self-tapping screw to prevent water from seeping into the transom. If you have drilled a hole through the transom, apply marine sealant to the space around the cable where it passes through the transom.

8. Position the two cable clamps and fasten them in place. If used, push the cable cover over the cable and screw it in place.
9. Route the cable to the instrument being careful not to tear the cable jacket when passing it though the bulkhead(s) and other parts of the boat. To reduce electrical interference, separate the sensor cable from other electrical wiring and "noise" sources. Coil any excess cable and secure it in place with zip-ties to prevent damage.

4.6 Optional Water Temperature/Speed Sensor

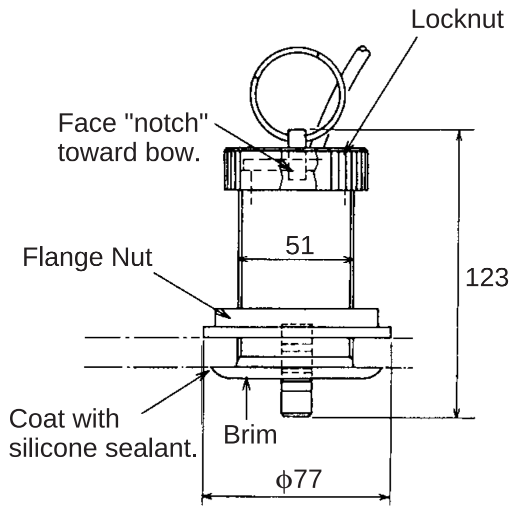
Water temperature/speed sensor ST-02MSB and ST-02PSB, which are designed for thru-hull mounting, are optionally available. Install them as shown below.

Mounting considerations

Choose a suitable mounting location considering the following:

- Choose a place free from vibration.
- Choose a mid-boat flat position. The sensor does not have to be installed perfectly perpendicular. The sensor must not be damaged in dry-docking operation.
- Choose a place apart from equipment generating heat.
- Choose a place in the forward direction viewing from the drain hole, to allow for circulation of cooling water.

1. Dry-dock the boat.
2. Make a hole of approx. 51 mm diameter in the mounting location.
3. Unfasten locknut and remove the sensor section.
4. Apply high-grade sealant to the flange of the sensor.
5. Pass the sensor casing through the hole.
6. Face the notch on the sensor toward boat's bow and tighten the flange.
7. Set the sensor section to the sensor casing and tighten the locknut.
8. Launch the boat and check for water leakage around the sensor.

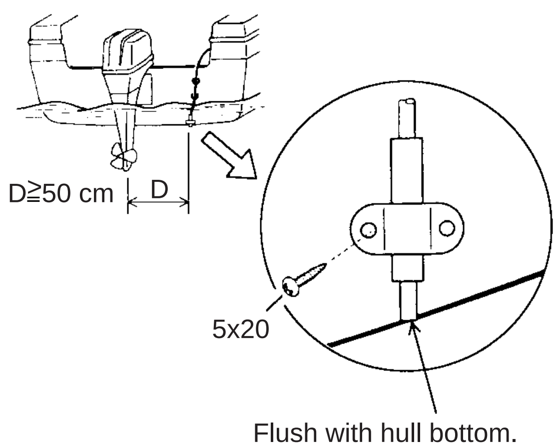


Water temperature/speed sensor ST-02MSB, ST-02PSB

4.7 Optional Water Temperature Sensor

Transom mount water temperature sensor T-02MTB

- Fix the cable at a convenient location on the transom with the cable clamp.
- When the cable is led through the transom board, make a hole of approx. 17 mm in diameter to pass the connector. After passing the cable, seal the hole with a sealing compound.



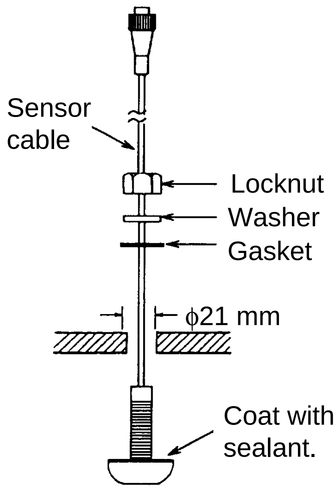
How to mount transom mount water temperature sensor T-02MTB

Thru-hull mount water temperature sensor T-02MSB, T-03MSB

- Select a suitable mounting location considering the following points:
- Select a mid boat flat position. The sensor does not have to be installed perfectly perpendicular; however, the location should not be such that the transducer may be damaged when the boat is dry-docked.
- Locate away from equipment which gives off heat.
- Locate away from drain pipes.
- Select a location where vibration is minimal.

Procedure for mounting T-02MSB

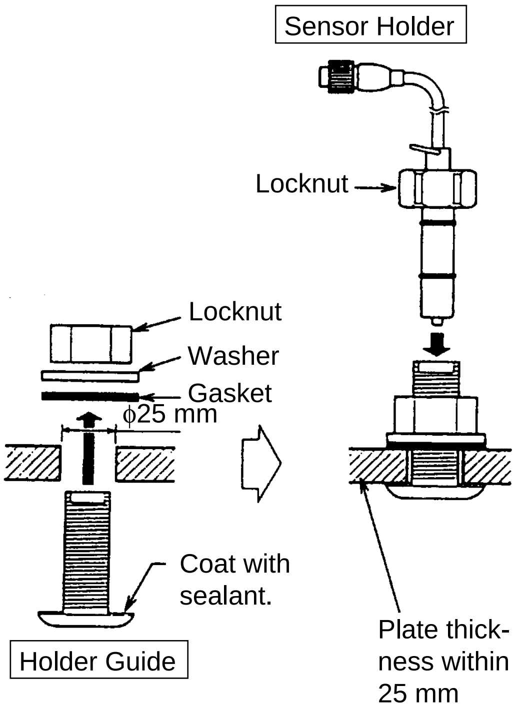
1. Drill a hole of 21 mm in diameter in the mounting location.
2. Pass the sensor cable through the hole.
3. Pass gasket, washer and locknut onto cable in that order.
4. Coat the sensor flange with high quality sealant and then fasten the sensor with the locknut. (Torque: max. 59N · m)
5. Launch the boat to check for water leakage around the sensor.



Mounting T-02MSB

Procedure for mounting T-03MSB

1. Drill a hole of 25 mm in diameter in the mounting location.
2. Coat holder guide with high quality sealant, and pass gasket, washer and locknut onto holder guide in that order and then tighten the locknut.
3. Set the sensor holder to the holder guide from inside the boat and then tighten the locknut.
4. Launch the boat to check for water leakage around the sensor.



Mounting T-03MSB

4.8 Wiring

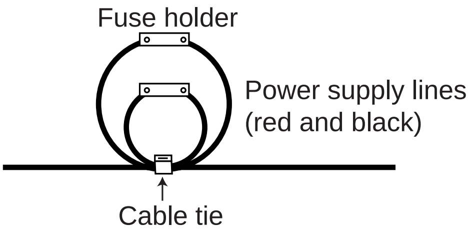
Connect the power/data cable assy KON-004-02M (2 m, supplied) to the 12-24 VDC/ NMEA port, and the transducer cable to the XDR port. Refer to the interconnection diagram to connect cables. Leave slack in cables to facilitate checking and maintenance.

Note1: Attach the MJ cable cap (supplied) to the transducer cable to protect the connector when the display unit is removed.

Note2: Cut unused cores and tape them.

Note3: Connector of cable edge breaks easily. Be careful when connecting or disconnecting the connector.

Note4: The fuse holder contains a spring which fixes the fuse. To prevent detachment of the spring, which would cause loss of power, tie the line as shown on the next page.



How to fix fuse holders

Establishing the ground

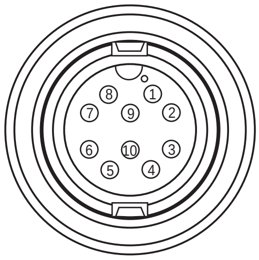
The ground wire (1.25 sq or more, local supply) should be as short as possible. The signal line ground is isolated from the chassis ground, however the power line is not insulated. Therefore, when connecting eternal equipment having positive ground, do not ground the signal line to the chassis. If excessive noise shows on the screen, the ground may be inadequate. In this case, attach a steel plate measuring 20 cm by 30 cm on the outside of the hull to provide a ground point. Connect the ground wire there. Use a "closed" type lug ( ) to make the connection at the display unit. Do not use an "open" type lug ( ).

Optional equipment

Power connector

The power supply port is commonly used for connection of external equipment such as a GPS receiver or wind indicator. Refer to the interconnection diagram to connect cables.

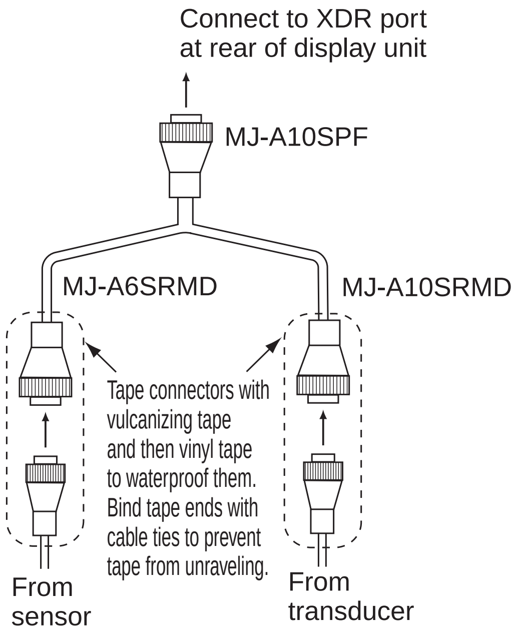
Connector		Color	Remarks
1	TD-A	WHT	IEC61162-1/ NMEA0183
2	TD-B	BLU	
3	RD-A	YEL	IEC61162-1/ NMEA0183
4	RD-B	GRN	
5	TEMP-IN	BRN	Temperature analog input
6	TEMP-IN-0V	ORG	
7	DC-P-IN (+)	RED	Power input 12-24 VDC
8	DC-M-IN (-)	BLK	
9	NC	-	
10	SHIELD	-	



Pin assignment (front view)

Water temp/speed sensor

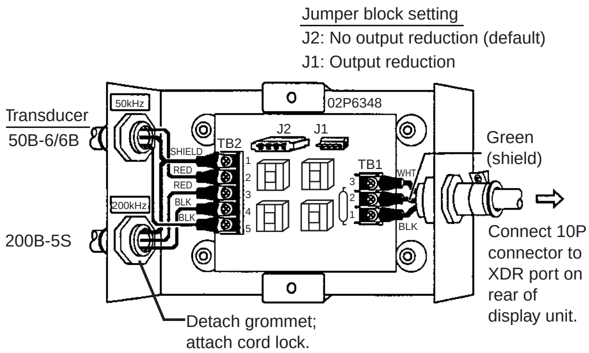
Connect the optional water temp/speed sensor to the XDR port with the optional conversion cable (Type 02S4147) as shown below.



Connection of conversion cable 02S4147

Optional transducer

The optional matching box (Type: MB-1100, Code No.: 000-041-353) is required to connect the optional transducers 50B-6, 50B-6B, 200B-5S, 50/200-1T.



Matching box MB-1100, cover removed

Matching box MB-1100

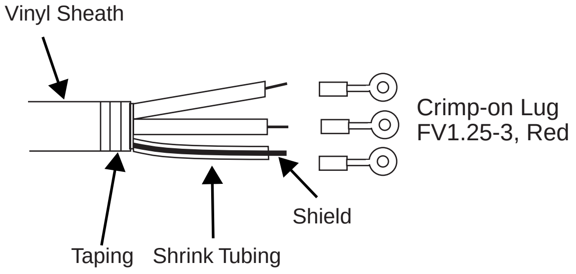
Part	Type	Code No.	Qty
Matching Box*	MB-1100	000-041-000	1
Crimp-on Lug	FV1.25-3, red	000-538-113	6
Cord Lock**	NC-1	000-516-650	1

*: With 10P connector cable

**: For connecting two transducers

Fabricating the transducer cable

Fabricate the transducer cable as below and connect it to the matching box.



How to fabricate the transducer cable

4.9 IEC 61162-1 Data Sentences

The table below shows the data sentences which can be input to and output from the FCV-620/585. The transmission speed for both input and output is 4,800 bps. Data is transducer cableoutput at two-second intervals.

Input data sentences

Sentence	Meaning
BWC	Bearing and distance to waypoint.
GGA	Global positioning system (GPS) fix data.
GLL	Geographic position - latitude/longitude.
HDG	Heading, deviation and variation.
HDT	Heading, true.
MDA	Atmospheric pressure.
MTW	Water temperature.

Input data sentences (con't)

MWV	Wind speed and angle.
RMA	Recommended minimum specific LORAN-C data.
RMB	Recommended minimum navigation information.
RMC	Recommended minimum specific GPS/TRANSIT data.
VHW	Water speed and heading.
VTG	Course over ground and ground speed.
XTE	Cross track error.

Order of priority

Latitude/Longitude: GGA>RMC>RMA>GLL
Course (true): VTG>RMC>RMA
Course (magnetic): VTG
Ground speed: VTG>RMC>RMA
Water speed: VHW
Distance to waypoint: BWC>RMB
Bearing to waypoint (true): BWC>RMB
Bearing to waypoint (magnetic): BWC
Heading (true): HDT>VHW
Heading (magnetic): HDG>VHW
Cross track error: XTE>RMB
Atmospheric pressure: MDA
Water temperature: MTW
Wind speed and angle (true/apparent): MWV

Output data sentences

Sentence	Meaning
DBT (Ver. 1.5)	Depth below transducer
DPT (Ver. 2.0, Ver. 3.0)	Depth
MTW*	Water temperature
VHW*	Water speed and heading
TLL*	Target position, output by **MARK** key.

*= Available with connection of optional sensors/navaid

4.10 Adjustments after Installation

NMEA

1. Press the **MENU/ESC** key to open the menu.
2. Use ▲ or ▼ to choose NMEA under System menu and press the **ENTER** key.

```
NMEA
NMEA0183       : Ver 2.0
NMEA Port      : In/Out
NMEA Output    : Off
WAAS Setup     : Off
TLL Output     : TLL
Port Monitor

▲/▼/◀/▶ : Select
[ENTER]  : Enter
[MENU]   : Back
```

NMEA menu

NMEA0183

Choose NMEA0183 version of nav equipment connected to “12-24 VDC/NMEA” port among Ver 1.5, Ver 2.0 or Ver 3.0.

NMEA Port

The NMEA terminals in the “12-24 VDC/ NMEA” port can function as input ports or input/output port. Change the setting to "In/In" when connecting GP-310B/320B and a wind sensor.

When connecting the GP-320B and a wind sensor, first turn on "WAAS Setup" and then select "In/In" as the NMEA Port setting.

In/Out: Input and Output (default setting)
In/In: Input only (Available with connection of the GP-310B/320B and a wind sensor.)

NMEA Output

Set the output data sentences (see the left-table).

Off: Outputs the “output data sentences” of FCV-620/585 only.
On: Outputs the “output data sentences” of FCV-620/585 and sentences which are input from other equipment.

WAAS Setup

Choose how to use the WAAS signal when connecting with a WAAS receiver, for example GP-320B. The message types (WAAS-00 to WAAS-27) are used as WAAS correction. Choose WAAS-00 to enable WAAS.

Note: This function is available only when In/ Out is selected at NMEA Port.

TLL Output

Output the position specified by **MARK** key to the plotter connected.

Off: Does not output latitude/longitude.
TLL: Outputs latitude/longitude.
FURUNO-TLL: Outputs latitude/longitude, depth and water temperature. Required FURUNO-TLL enabled device.

Port Monitor

Port Monitor provides information for the data sentences input to the 12-24 VDC/NMEA port.

```
Port 1          Port Monitor
$GPGLL, 4928. 186, N, 00022. 705, E, 00035
2, A*24<0d><0a>
$GPVTG, , , 2.6, M, 1.0, N, 1.9, K*39<0d><0
a>
$GPRMC, 000352, A, 4928.186, N, 00022.70
5, E, 001.0, 000.0, 301006, 2.6, W*6B<0d>
<0a>
```

Press the **ENTER** key to display the latest data sentence information. To display this information on the Port 2 screen when two sensors are connected, set NMEA Port on the NMEA menu to In/In.

Transducer (FCV-585 only)

Choose transducer type among 600 W, 1 kW and 50/200-1T on the Sounder menu.

```
600W
1kW
50/200-1T
```

Transducer setting box

600 W: For 600 W transducer
50/200-1T: For 1 kW transducer (50B-6, 50B-6B, 200B-5S or 50/200-1T)
1 kW: For 1 kW transducer other than those mentioned above

MENU TREE

Bold: Default

- [MENU] key
  - Sounder
    - Pic. Advance (4/1, 2/1, ***1/1***, 1/2, 1/4, 1/8, 1/16, Stop)
    - Zoom Mode (***Bottom Lock***, Bottom Zoom, Marker Zoom)
    - Shift (0 - 2500 ft, ***0 ft***)
    - Bottom Zone
    - Interference (Off, Low, Medium, High, ***Auto***)
    - Color Erase (0 - 50 %, ***0 %***)
    - Clutter (0 - 100 %, ***0 %***)
    - White Line (0 - 50 %, ***0 %***)
    - White Marker
    - TVG (Low, ***Medium***, High)
    - Smoothing (Off, ***On***)
    - TX Power (***Auto***, 10 - 100 %)
    - TX Rate (1 - ***10***, S)
    - Transducer* (***600 W***, 1 kW, 50/200-1T) *: FCV-585 only
  - Display
    - A-Scope (***Off***, Normal, Peak)
    - Depth Size (Small, Medium, ***Large***)
    - Zoom Marker (***Off***, On)
    - Temp Graph (***Off***, Narrow, Wide)
    - Window Size
    - Battery (***Off***, On)
    - Color Bar (Off, ***On***)
    - Palette (***White***, Blue, Black, Gray, Night)
    - Colors (8, 16, ***64***)
    - Header Info (Off, ***On***)
    - Nav Data1 (, ,)
    - Nav Data2 (, ,)
    - Fish Info (***Off***, Fish Size, Depth)
    - Fish Symbols (***Off***, Solid, Striped)
  - Alarm
    - Bottom (***Off***, On)
    - From (0 - 2500 ft, ***0 ft***)
    - Span (1 - 2500 ft, ***10 ft***)
    - Fish (Normal) (***Off***, On)
    - From (0 - 2500 ft, ***0 ft***)
    - Span (1 - 2500 ft, ***10 ft***)
    - Fish (B/L) (***Off***, On)
    - From (0.0 - 30.0 ft, ***0.0 ft***)
    - Span (0.1 - 30.0 ft, ***1.0 ft***)
    - Fish Level (Weak, ***Medium***, Strong)
    - Temperature (***Off***, Inside, Outside)
    - From (20.0 - 110.0 °F, ***65.0 °F***)
    - Span (0.1 - 30.0 °F, ***1.0 °F***)
    - Speed (***Off***, Inside, Outside)
    - From (0.0 - 99.0 kt, ***0.0 kt***)
    - Span (1.0 - 50.0 kt, ***1.0 kt***)
    - Arrival (***Off***, Inside, Outside)
    - Radius (0.01 - 99.99 nm, ***0.01 nm***)
  - (1)

(2)

- Data
  - Go to WPT (***Off***, Destination 1 - 20)
  - WPT List
  - Data Box 1 (***Off***, Speed (SOG), Speed (STW), Depth, Range, Bearing, Position, Wind, Heading, Course, Barom Press, Temp, Time to Go, Trip meter, Odometer, XTE)
  - Data Box 2 (Same as Data Box 1)
  - Bearing (***True***, Mag)
  - Wind Spd/Dir (***True***, Apparent)
  - Trip Source (Off, ***Own***, NMEA)
  - Temp Source (Off, ***Own***, NMEA)
  - Speed Source (Off, ***Own***, NMEA)
  - Trip Reset (Yes, ***No***)
  - Odo Reset (Yes, ***No***)
- System
  - Range
    - Range 1 (7 - 2500 ft, ***15 ft***)
    - Range 2 (7 - 2500 ft, ***30 ft***)
    - Range 3 (7 - 2500 ft, ***60 ft***)
    - Range 4 (7 - 2500 ft, ***120 ft***)
    - Range 5 (7 - 2500 ft, ***200 ft***)
    - Range 6 (7 - 2500 ft, ***400 ft***)
    - Range 7 (7 - 2500 ft, ***600 ft***)
    - Range 8 (7 - 2500 ft, ***1000 ft***)
    - Zoom Range (7 - 2500 ft, ***15 ft***)
    - B/L Range (10 - 30 ft, ***15 ft***)
  - Key
    - FUNC Key (***Pic. Advance***, Shift, Interference, Clutter, Color Erase, White Line, White Marker, WPT List, Bottom Zone)
    - Key Beep (Off, ***On***)
  - Lang
    - Language (***English***, OTHERS)
  - Units
    - Depth (m, ***ft***, fa, pb, HR)
    - Temp (°C, °***F***)
    - Fish Size (***inch***, cm)
    - Speed (***kt***, km/h, mph)
    - Wind (***kt***, km/h, mph, m/s)
    - Distance (***nm***, km, sm)
  - NMEA
    - NMEA0183 (Ver 1.5, ***Ver 2.0***, Ver 3.0)
    - NMEA Port (***In/Out***, In/In)
    - NMEA Output (***Off***, On)
    - WAAS Setup (***Off***, WAAS-00 - WAAS-27)
    - TLL Output (Off, ***TLL***, FURUNO-TLL)
    - Port Monitor
  - Calib
    - Draft (-15.0 - +50.0 ft, ***+0.0 ft***)
    - Gain ADJ 200 (-20 - +20, ***+0***)
    - Gain ADJ 50 (-20 - +20, ***+0***)
    - Temp (-20.0 - +20.0 °F, ***+0.0 °F***)
    - Speed (STW) (-50 - +50 %, ***+0 %***)
    - Fish Size (-80 - +100, ***+0 %***)
    - Water Type (***Salt***, Fresh)
    - Zero Line
      - Rejection (Off, ***On***)
      - Area (4.5 - 9.8 ft, ***4.5 ft***)
  - Demo
    - Demonstrate (***Off***, Demo1, Demo2)
  - Tests
    - Test
    - LCD Test
  - Reset
    - Factory Reset (Yes, ***No***)

SPECIFICATIONS OF ECHO SOUNDER FCV-620/585

1. GENERAL

1.1	TX Frequency	50 kHz and 200 kHz
1.2	Transmit Method	Single or dual frequency transmitting
1.3	Output Power	
	FCV-620	600 W
	FCV-585	600 W or 1 kW selectable
1.4	TX Rate	Max. 3,000 pulse/min
1.5	Pulse-length	0.04 to 3.0 ms
1.6	Sensitivity	10 dBμV

2. DISPLAY UNIT

2.1	Display System	
	FCV-620	5.6-inch color LCD, 84.7 mm (W) x 113.3 mm (H), 234 x 320 dots
	FCV-585	8.4-inch color LCD, 121 mm (W) x 170 mm (H), 480 x 640 dots
2.2	Display Mode	Single frequency (high or low freq.), Dual frequency, Zoom (high or low freq.), Nav data 1/2, A-Scope
2.3	Expansion Mode	Bottom lock, Bottom zoom, Marker zoom
2.4	Basic Range	

Unit	Basic Range								Setting Range
	1	2	3	4	5	6	7	8	
m	5	10	20	40	80	150	200	300	2 to 800
ft	15	30	60	120	200	400	600	1,000	7 to 2,500
fa	3	5	10	20	40	80	100	150	2 to 400
pb	3	5	10	20	50	100	150	200	2 to 450
HR*	4	8	15	30	50	100	150	200	2 to 500

*: Japanese unit of depth measurement

2.5	Range Shift	0 to 800 m, 0 to 2,500 ft, 0 to 400 fa, 0 to 450 pb, 0 to 500 HR
2.6	Zoom Range	Bottom lock expansion: 3 to 10 m, 10 to 30 ft Bottom and Marker zoom: 2 to 800 m, 7 to 2,500 ft
2.7	Display Advance Speed	8 steps (Lines/TX; 4/1, 2/1, 1/1, 1/2, 1/4, 1/8, 1/16, Freeze)
2.8	Function Settings	Pic. Advance, Shift, Interference, Clutter, Color Erase, White Line, White Marker, WPT List, Bottom Zone
2.9	Display Color	Echo color: 8, 16 or 64 colors according to echo intensity Background color: White, blue, black, gray or night

3. INTERFACE

3.1	Input Data Sentences	IEC61162-1 (NMEA0183 Ver 1.5/2.0/3.0) Order of priority Latitude/Longitude: GGA>RMC>RMA>GLL Course (true): VTG>RMC>RMA Course (magnetic): VTG Ground speed: VTG>RMC>RMA Water speed: VHW Distance to waypoint: BWC>RMB Bearing to waypoint (true): BWC>RMB Bearing to waypoint (magnetic): BWC Heading (true): HDT>VHW Heading (magnetic): HDG>VHW Cross track error: XTE>RMB Atmospheric pressure: MDA Water temperature: MTW Wind speed and angle (true/apparent): MWV
3.2	Output Data Sentences	IEC61162-1 (NMEA0183 Ver 1.5/2.0/3.0), interval: 2 s DBT, DPT, MTW*, VHW*, TLL* by key operating *: External data required

4. POWER SUPPLY

4.1	FCV-620	12-24 VDC: 0.8-0.4 A
4.2	FCV-585	12-24 VDC: 1.0-0.5 A

5. ENVIRONMENTAL CONDITION

5.1	Ambient Temperature	-15 °C to +50 °C
5.2	Relative Humidity	93 % at 40 °C
5.3	Waterproofing and Dust Proofing (IEC60529)	IP55
5.4	Vibration	● 2-5 Hz and up to 13.2 Hz with an excursion of ±1 mm ±10 % (7 m/s^2 maximum acceleration at 13.2 Hz) ● 13.2-100 Hz with a constant maximum acceleration of 7 m/s^2

6. CHASSIS COLOR

6.1	Display Unit	Chassis: N-2.5 Bracket: N-1.75

D-1

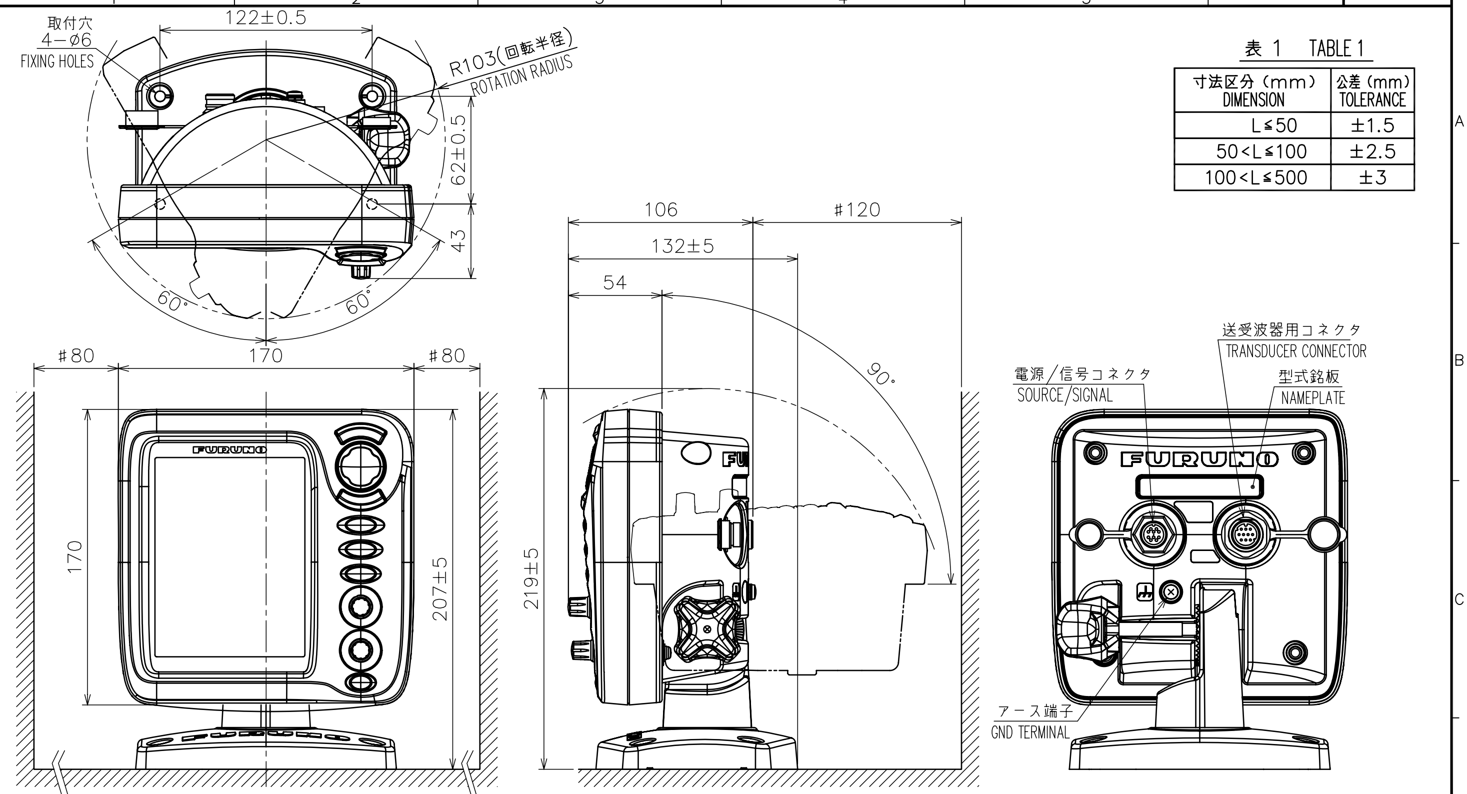


表 1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50＜L≦100	±2.5
100＜L≦500	±3

注 記 1) 指定外の寸法公差は表１による。
2) ＃印寸法は最小サービス空間寸法とする。
3) 取付用ネジは＋トラスタッピンネジ呼び径５×２５を使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø5x25 FOR FIXING THE UNIT.

DRAWN 28/May/2010 T.YAMASAKI		TITLE	CV-620
CHECKED 28/May/2010 T.TAKAHASHI		名 称	指示器（卓上装備）
APPROVED 28/May/2010 Y.NISHIYAMA	FCV-620		外寸図
SCALE	MASS 1.3 ±10% kg	NAME	DISPLAY UNIT (TABLETOP MOUNT)
DWG.No. C2374-G01- C	DWG.No. 02-154-100G-4		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

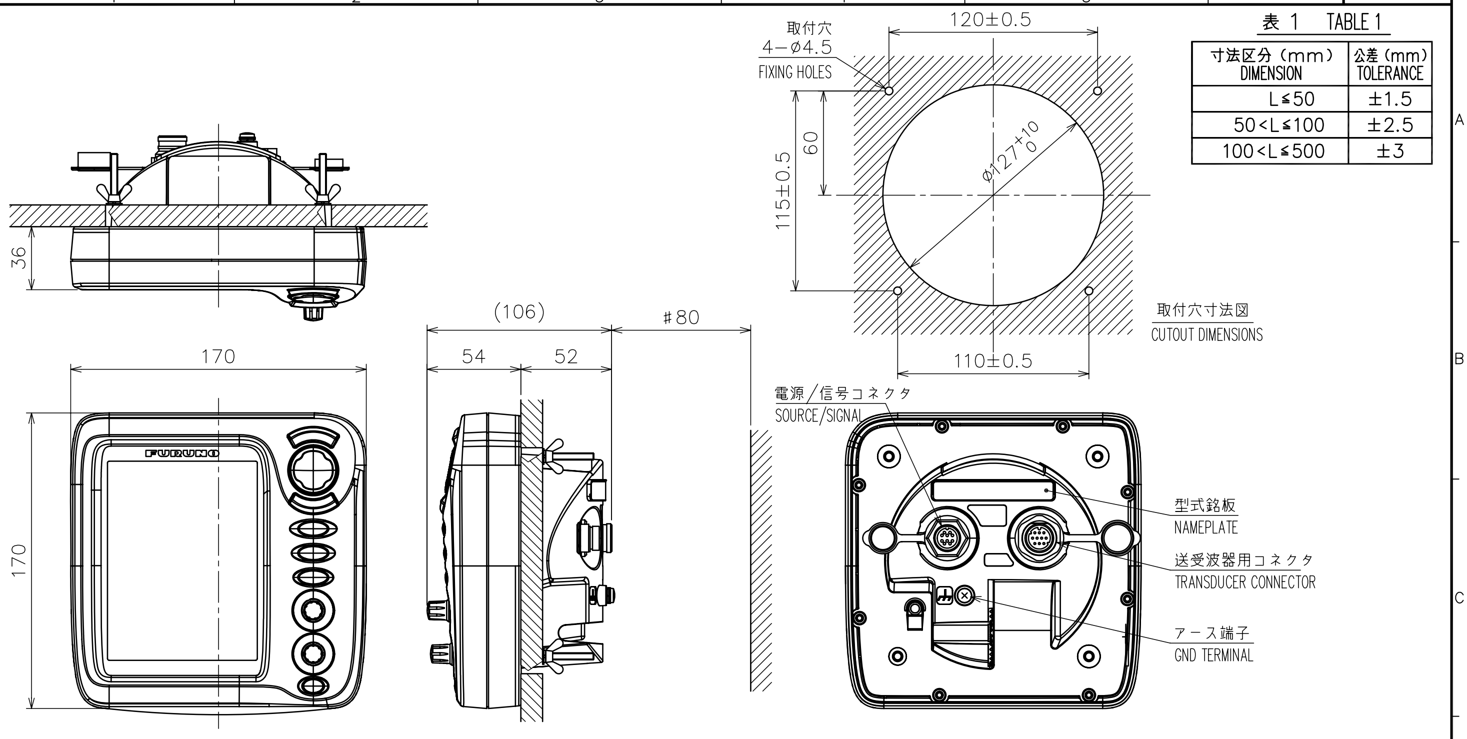


表 1 TABLE 1

寸法区分（mm） DIMENSION	公差（mm） TOLERANCE
L≦50	±1.5
50＜L≦100	±2.5
100＜L≦500	±3

注 記 1) 指定外の寸法公差は表１による。
2) ＃印寸法は最小サービス空間寸法とする。
3) 取付はＭ４×５０寸切ボルト、Ｍ４平座金・バネ座金・蝶ナットを使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M4x50 STUD BOLTS, M4 PLANE/SPRING WASHERS AND WING NUTS FOR FIXING THE UNIT.

DRAWN 28/May/2010 T.YAMASAKI		TITLE	CV-620
CHECKED 28/May/2010 T.TAKAHASHI		名 称	指示器（埋込装備）
APPROVED 28/May/2010 Y.NISHIYAMA	FCV-620		外寸図
SCALE	MASS 0.9 ±10% kg	NAME	DISPLAY UNIT (FLUSH MOUNT)
DWG.No. C2374-G02- C	DWG.No. 02-154-110G-4		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.

FURUNO

D-2

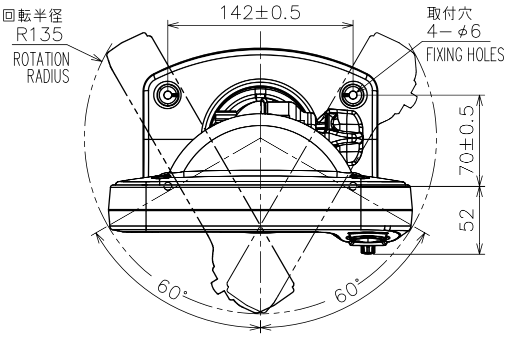
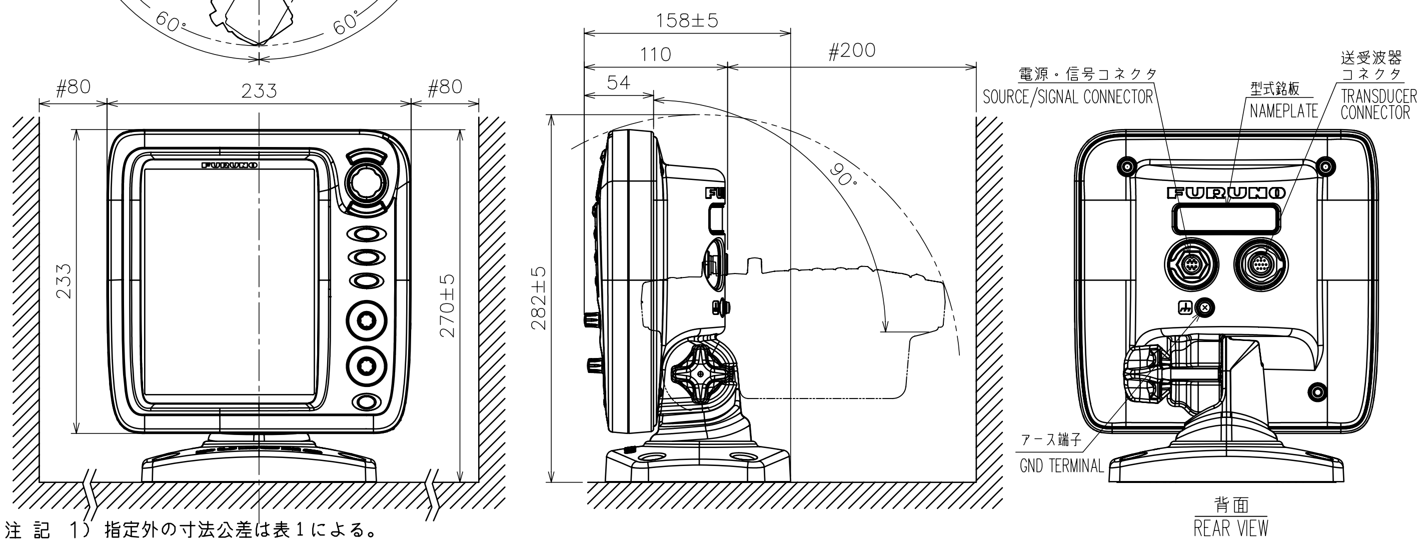


表 1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50＜L≦100	±2.5
100＜L≦500	±3



注 記 1) 指定外の寸法公差は表1による。
2) #印寸法は最小サービス空間寸法とする。
3) 取付用ネジはトラスタッピンネジ呼び径5×25を使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE TAPPING SCREWS ø5x25 FOR FIXING THE UNIT.

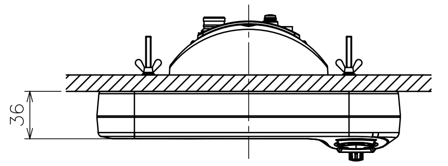
DRAWN 1/Apr/2010 T.YAMASAKI			TITLE	CV-585
CHECKED 1/Apr/2010 T.TAKAHASHI			名称	指示器（卓上装備）
APPROVED 2/Apr/2010 Y.NISHIYAMA	FCV-585			外寸図
SCALE	MASS 2.3 ±10% kg		NAME	DISPLAY UNIT (TABLETOP MOUNT)
DWG.No. C2375-G01- C	REF.No. 02-155-100G-4			OUTLINE DRAWING

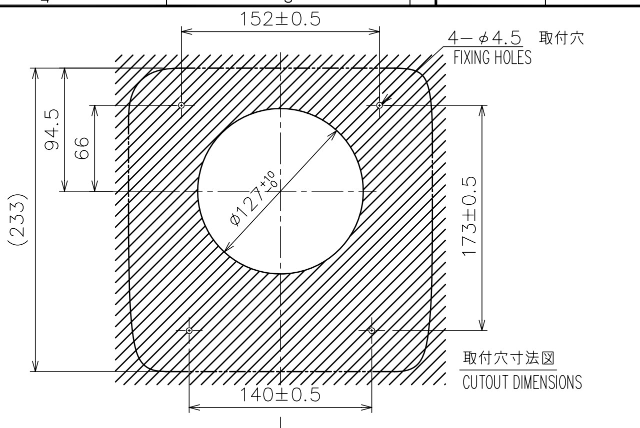
FURUNO ELECTRIC CO., LTD.

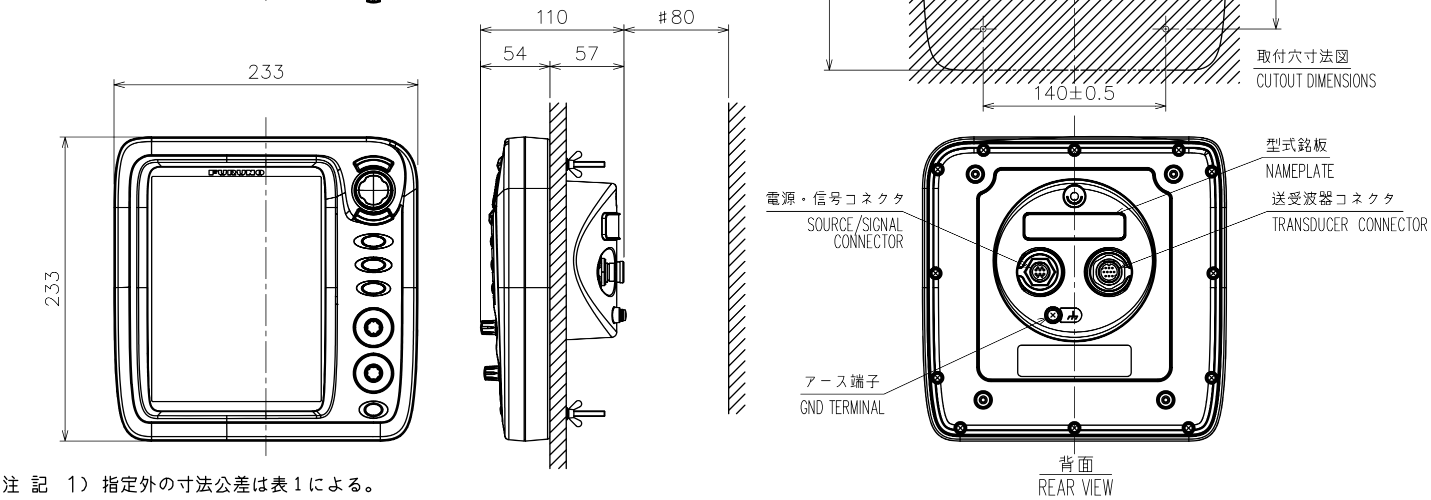
FURUNO

表1 TABLE 1

寸法区分 (mm) DIMENSION	公差 (mm) TOLERANCE
L≦50	±1.5
50＜L≦100	±2.5
100＜L≦500	±3





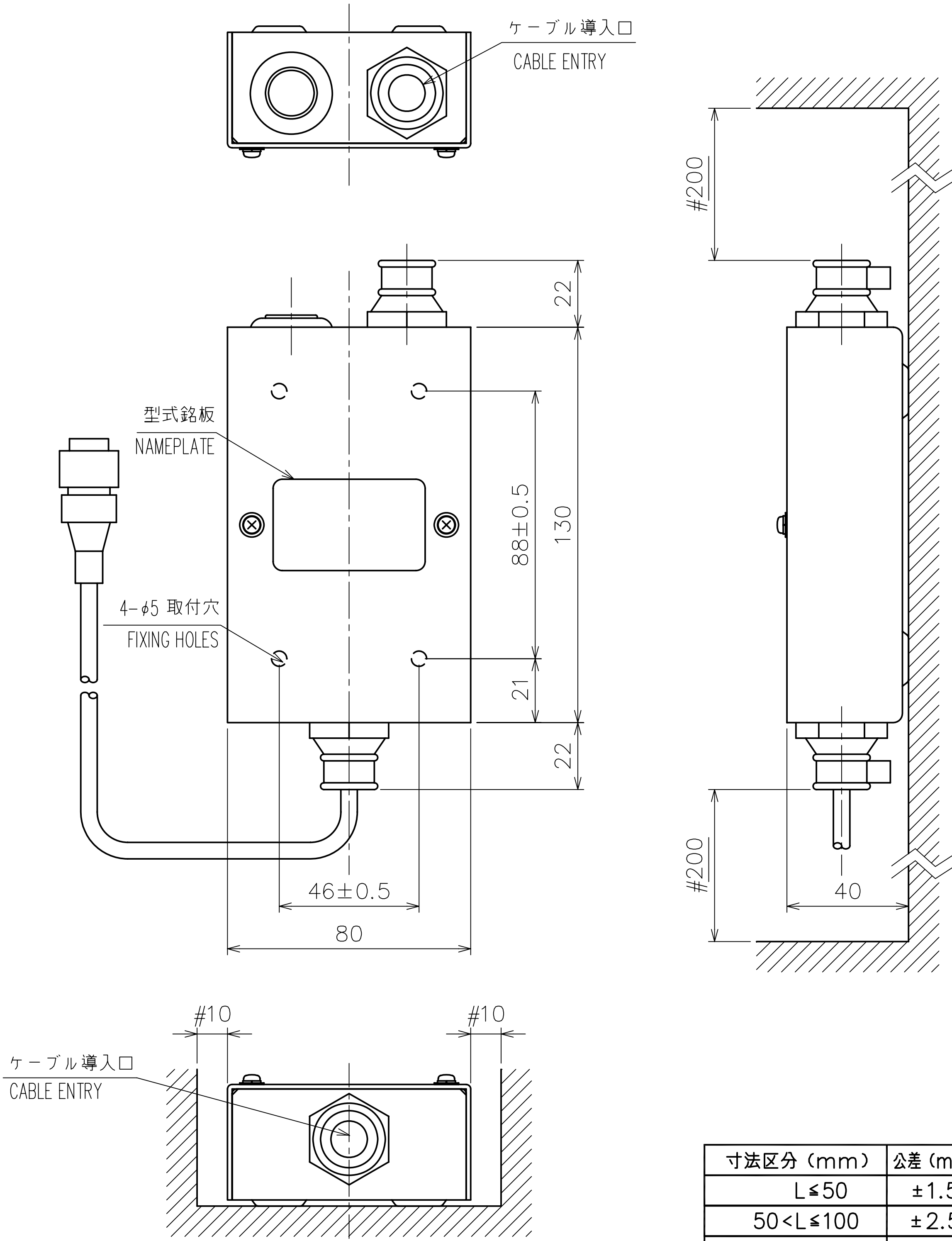


注 記 1) 指定外の寸法公差は表1による。
2) #印寸法は最小サービス空間寸法とする。
3) 取付はM4×50寸切ボルト、M4平座金・バネ座金・蝶ナットを使用のこと。

NOTE 1. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
2. #: MINIMUM SERVICE CLEARANCE.
3. USE M4x50 STUD BOLTS, M4 P.W./S.W./WING NUT FOR FIXING THE UNIT.

DRAWN 1/Apr/2010 T.YAMASAKI			TITLE	CV-585
CHECKED 1/Apr/2010 T.TAKAHASHI			名称	指示器（埋込装備）
APPROVED 2/Apr/2010 Y.NISHIYAMA	FCV-585			外寸図
SCALE	MASS 1.6 ±10% kg		NAME	DISPLAY UNIT (FLUSH MOUNT)
DWG.No. C2375-G02- D	REF.No. 02-155-110G-5			OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.



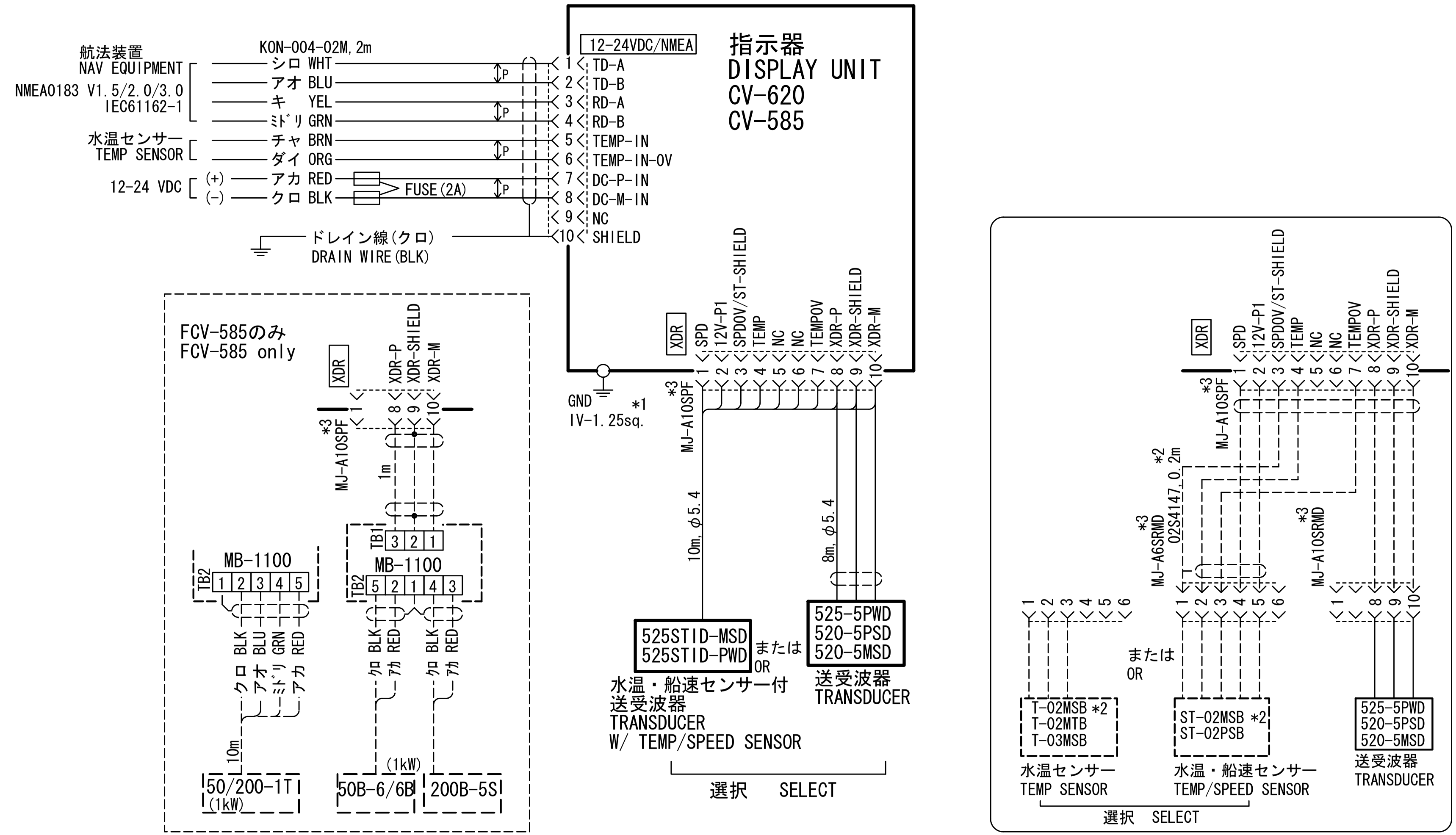
寸法区分（mm）	公差（mm）
L≦50	±1.5
50<L≦100	±2.5
100<L≦500	±3

注　記　1）　＃印寸法は最小サービス空間寸法とする。
2）　指定外の寸法公差は表１による。
3）　質量にケーブルを含む。

NOTE
1. #: MINIMUM SERVICE CLEARANCE.
2. TABLE 1 INDICATES TOLERANCE OF DIMENSIONS WHICH IS NOT SPECIFIED.
3. MASS INCLUDES CABLE.

DRAWN Jun. 16, '06 E. MIYOSHI		TITLE	MB-1100
CHECKED TAKAHASHI. T		名称	分配箱
APPROVED Y. Hatai	FCV-585		外寸図
SCALE 1/2	MASS 0.65 kg ±10%	NAME	MATCHING BOX
DWG.No. C2375-G03- B	REF.No. 02-155-200G- 1		OUTLINE DRAWING

FURUNO ELECTRIC CO., LTD.



注記
＊１）造船所手配。
＊２）オプション。
＊３）コネクタは工場にて取付済み。

NOTE
*1. SHIPYARD SUPPLY.
*2. OPTION.
*3. CONNECTOR PLUG FITTED AT FACTORY.

DRAWN	28/Sep/2010 T. YAMASAKI	TITLE	FCV-620/585
CHECKED	28/Sep/2010 T. TAKAHASHI	名 称	カラーLCD魚探
APPROVED	29/Sep/2010 Y.NISHIYAMA		相互結線図
SCALE	MASS	NAME	COLOR LCD SOUNDER
DWG. No. C2374-C01- J	REF. No. 02-154-1001-2		INTERCONNECTION DIAGRAM

FURUNO ELECTRIC CO., LTD.

FURUNO ELECTRIC CO., LTD.
9-52 Ashihara-Cho, Nishinomiya City, 662-8580, Hyogo, Japan
Tel: +81 798-65-2111 Fax: +81 798-65-4200

Pub NO. DOC-850

EC Declaration of Conformity

We FURUNO ELECTRIC CO., LTD.

(Manufacturer)

9-52 Ashihara-Cho, Nishinomiya City, 662-8580, Hyogo, Japan

(Address)

declare under our sole responsibility that the product

Color video sounder Type FCV-620 consisting of Display unit FCV-620, Transducer 520-5PSD and Speed-temperature sensor ST-02PSB

(Model name, serial number)

to which this declaration relates is in conformity with the following standard(s) or other normative document(s)

EN 60945: 1997-01 (IEC 60945 Third edition: 1996-11) – Clauses 9.2, 9.3, 10.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8 and 10.9
IEC 60945 Fourth edition: 2002-08 – Clauses 9.2, 9.3, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8 and 10.9

(title and/or number and date of issue of the standard(s) or other normative document(s))

For assessment, see

- EMC Test Report FLI 12-05-044 of 19 October 2005 prepared by Furuno Labotech International Co., Ltd.

This declaration is issued according to the Council Directive of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (89/336/EEC).

On behalf of Furuno Electric Co., Ltd.

Hiroaki Komatsu
Manager,
International Rules and Regulations

(name and signature or equivalent marking of authorized person)

Nishinomiya City, Japan
October 20, 2005

(Place and date of issue)

FURUNO ELECTRIC CO., LTD.
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Tel: +81 798-65-2111 Fax: +81 798-65-4200

Pub NO. DOC-852

EC Declaration of Conformity

We FURUNO ELECTRIC CO., LTD.

(Manufacturer)

9-52 Ashihara-Cho, Nishinomiya City, 662-8580, Hyogo, Japan

(Address)

declare under our sole responsibility that the product

Color video sounder Type FCV-585

(Model name, serial number)

to which this declaration relates is in conformity with the following standard(s) or other normative document(s)

EN 60945: 1997-01 (IEC 60945 Third edition: 1996-11) – Clauses 10.2 and 10.3
IEC 60945 Fourth edition: 2002-08 – Clauses 9.2, 9.3, 10.3, 10.4, 10.5, 10.8 and 10.9

(title and/or number and date of issue of the standard(s) or other normative document(s))

For assessment, see

- EMC Test Report FLI 12-05-053 of 14 November 2005 prepared by Furuno Labotech International Co., Ltd.

This declaration is issued according to the Council Directive of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility (89/336/EEC).

On behalf of Furuno Electric Co., Ltd.

Hiroaki Komatsu
Manager,
International Rules and Regulations

(name and signature or equivalent marking of authorized person)

Nishinomiya City, Japan
November 16, 2005

(Place and date of issue)